STAND-IN + STAND-OFF AIRPOWER 46 | LINE OF DUTY INJURIES 52 | SHOT DOWN, RESCUED & FORGOTTEN 34

SECRETARY TROY MEINK: FIRST INTERVIEW 14

AIR & SPACE FORCES

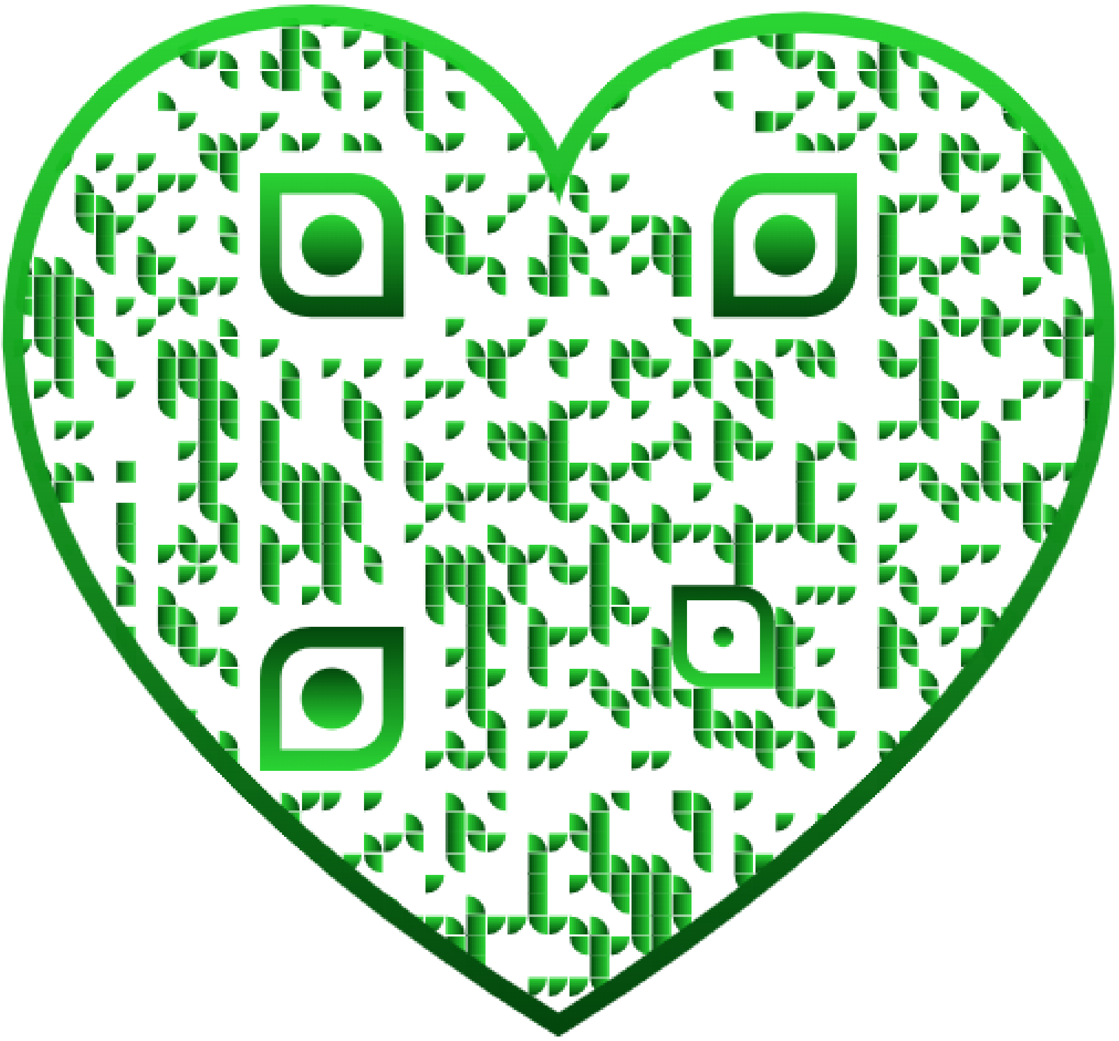
airandspaceforces.com

50 YEARS OF STEALTH

Why USAF's bet on the F-117 remains a winner today.
39-44

September/October 2025 $8

Published by the Air & Space Forces Association



Command the battlespace
boeing.com/e-7
BOEING

AIR & SPACE FORCES
September/October 2025, Vol. 108, Nos. 9 & 10 airandspaceforces.com

USAF

AC-119 gunships were potent weapons in Vietnam, but daytime flights put them at risk. What happened when one went down? p. 34.

FEATURES

14 Profile: Meet Troy Meink, Secretary of the Air Force

34 'Prepare to Abandon the Aircraft!'
By Matthew Cox
Inside a Vietnam War aircrew's shootdown and the fight to honor their courage.

39 The F-117 and the Future of Stealth
By John A. Tirpak
Stealth was a gamble 50 years ago. It's still a good bet.

46 The Force We Need: Standoff and Penetrating Airpower
By Col. Mark A. Gunzinger, USAF (Ret.), and Heather R. Penney
How the U.S. can counter China's size and other advantages.

52 Airmen Injured On Duty; Why isn't the Air Force Paying?
By David Roza
Receiving disability compensation has become a complicated process.

59 2025 Outstanding Airmen of the Year
Recognizing 2025's class of top-performing Airmen.

DEPARTMENTS

2 Editorial: Dear Chief ... By Tobias Naegele

4 Letters

4 Index to Advertisers

6 Strategy & Policy: A New Bomber Era Arrives

10 Airframes

16 Verbatim

17 Faces of the Force

18 World: Air Force Chief of Staff General Allvin retires; Gen. Adrian Spain takes over at ACC; Wargames test technology in the Pacific; New part-time concept for Space Force Guardians; Vulcan Centaur's historic launch; Space Force looking to expand intel sharing; and more.

62 AFA in Action: Teacher of the Year, Ashlie Smith; Doolittle Leadership Center: Building Better Leaders

64 Heroes/Leaders: William H. Tunner

ON THE COVER

Lockheed Martin Photography/Judson Brohmer

F-117 Nighthawk stealth fighters soar over the California mountains near Edwards AFB, Calif., in 2000. The Nighthawk was the first operational aircraft to exploit low-observable stealth technology.

STAFF

Publisher
Burton M. Field
Editor in Chief
Tobias Naegele

Managing Editor
Chequita Wood
Editorial Director
John A. Tirpak
Senior Designer
Dashton Parham
News Editor
Greg Hadley
Pentagon Editor
Chris Gordon
Senior Editor
David Roza
Congressional Editor
Rachel Cohen
Production Manager
Eric Chang Lee
Photo Editors
Jud McCrehin
Zaur Eylanbekov
AFA in Action Editor
Patrick Reardon

Contributors
Mattew Cox,
Col. Mark A. Gunzinger, USAF (Ret.),
Susan Mallett,
Col. Phillip S. Meilinger, USAF (Ret.),
Heather R. Penney

MEDIA NETWORK

ADVERTISING:
Christy Sitter
VP of Sales
703.247.5837
csitter@afa.org

SUBSCRIBE & SAVE
Subscribe to *Air & Space Forces Magazine*, plus get a free membership to the Air & Space Forces Association.
1-800-727-3337

Air & Space Forces Magazine (ISSN 2834-8206) September/October 2025 (Vol. 108, Nos. 9 and 10) is published **bi-monthly** in January/February, March/April, May/June, July/August, September/October, and November/December by the Air & Space Forces Association, 1201 S. Joyce St. C6, Arlington, VA 22202-2066. Phone (703) 247-5800. Periodical postage paid at Arlington, Va., and additional mailing offices. **Membership Rate:** $50 per year; $35 e-Membership; $125 for three-year membership. **Subscription Rate:** $50 per year; $29 per year additional for postage to foreign addresses (except Canada and Mexico, which are $10 per year additional). Regular issues $8 each. USAF Almanac issue $18 each. **Change of address** requires four weeks' notice. Please include mailing label. **POSTMASTER:** Send changes of address to Air & Space Forces Association, 1201 S. Joyce St., C6, Arlington, VA 22202-2066. Publisher assumes no responsibility for unsolicited material. Trademark registered by Air & Space Forces Association. Copyright 2025 by Air & Space Forces Association.

EDITORIAL

By Tobias Naegele

A Letter to the Next CSAF

Dear Chief,

Congratulations on your selection. Just two dozen men have survived the culling to become Chief of Staff. Over the years I've interviewed 13 of them, plus perhaps two dozen other members of the Joint Chiefs of Staff. Here's what those conversations have taught me.

Statutorily it's a four-year assignment. You might have signed on for less, but most who've held the job will tell you four years is too short to accomplish all you want. Being Chief is an all-you-can-eat affair, but you're on the clock the entire time. It could take a year before you have any real input on the budget; two before you really have a full handle on the rhythm of the role. By the end of the third year, you're a dead man walking—if you get that far.

Of the last 11 Chiefs, two were fired and two retired early. One of those was on principle; the other was under pressure.

It goes without saying that the first thing you need to do is be true to yourself. That's easier said than done.

Up to this point you've been the big man on campus, but relatively invisible everywhere else. You're still the same guy you were 10 or 20 years ago, just a bit grayer at the temples, wiser to be sure. Your staff thinks you are brilliant, strives to keep up with you, marvels at your energy. People love you. You can speak your mind. Sure, you might preface some of those comments with "don't put this on Facebook …" but you do so with confidence because no one is really out to get you.

That's not true anymore. From here on out, every word you say will be parsed. You will be held accountable for every negative headline, every delayed program, every blunder by an Airman, whether in Washington or on some far-off remote base that, in an instant, can fuel a political storm or blow up into an international incident. Every one of those things can throw you off your game, disrupt your agenda, set you back from accomplishing your goals.

Being true to yourself means understanding who you are, what you stand for, what compromises you are unwilling to make. Call it honor, integrity, character—it's what will make others respect you and ensure you respect yourself after the fact.

Focus on a few things and make those the focus for everyone. Start with readiness.

Make a list of three or four things that are most important to your Air Force. This is where you need to focus your time. You will have a packed schedule from morning until night. Every one of those meetings will be the most important thing someone else will do that day. You owe it to them to respect their moment in the spotlight. But you also owe it to yourself and your Air Force not to get lost in the minutiae.

People will come to you for decisions that only you can make. But there is a difference between the questions only you have the wisdom to answer and those that belong to you by virtue of your job. Distinguishing between the two will save you time and brainpower. Former President Ronald Reagan's famous "trust but verify" approach to arms control can apply here as well: Challenge assumptions, ask about alternatives, but be willing to trust your subordinates. You didn't get to this level on your own, and you won't succeed at this level on your own. Success is a team sport.

Focus on a few things and make those the focus for everyone. Start with readiness.

China targeted 2027 as the year by which its military should be able to seize Taiwan by force. That's just 16 months away. Your team is almost done with its 2027 budget submission, and you haven't even been sworn in yet.

Air Force Secretary Troy Meink, just three months on the job himself, said the thing that's surprised him most since becoming Secretary was the state of readiness. That won't surprise you, because you've been living it. Past administrations under both parties allowed this to happen. Your job is to get things moving in the other direction.

Modernization is every Chief's preoccupation. Technology and warfare evolve rapidly, and he who stands still loses. Your predecessors have set you up with a large portfolio of programs America can't afford to fail: The B-21 Raider bomber is flying, and all indications it's on schedule and within budget. Keeping it on track and increasing the planned buy should be a priority. Collaborative Combat Aircraft, the semi-autonomous drones that could revolutionize air combat, are progressing rapidly. Keep your foot on the gas.

After that, it's hazier. The brand-new F-47 fighter program will be expensive, which means the knives will be out annually, a risk to such a high-priority program. ICBM, an existential requirement, is behind schedule and way over cost. The KC-46 tanker, though a major upgrade over predecessors, is taking years to work out the kinks. The T-7 trainer, selected seven years ago with the promise of rapidly moving from prototype to production, has yet to deliver a production model. The E-7 Wedgetail, needed to replace the E-3 AWACS, is on the chopping block and shouldn't be.

Your biggest modernization program isn't even under your control, but rather is run by a joint office accountable to others. Congress and the White House have taken a hard line against the F-35 because of delays in development and delivery of upgrades. Pilots rave about what the plane can do, but rising costs, underwhelming readiness, over-ambitious promises, and contractors pointing blame at each other have Congress and the White House questioning the program's value. That in turn has led to a slowdown in F-35 purchases.

Here's where your two priorities collide. You need more F-35s faster to replace the aging aircraft you want to retire; but the F-35s are only mission-capable half the time because of parts and maintainer shortages.

Readiness is ultimately a people problem. You can't get enough pilots through training fast enough to staff your Air Force; you don't have enough planes for them to train on; you have too few experienced maintainers. They like the work, but the lifestyle is hard. You need to empower staff to identify the things, from logistics to personnel, that make being in the Air Force burdensome without making results better. Get rid of those irritants and morale will improve.

One more thing: Don't start from scratch. Most new commanders want to come in with a bang. Some look to fire someone quickly, establishing supremacy and instilling fear. Others unveil new slogans, commission studies, move furniture. Gen. David Allvin's original catchphrase "follow through" had one thing going for it. He wasn't reinventing the Air Force. That's not to say you should leave everything as you find it, but rather to say, again, to prioritize. Some things should be undone. Others can be left alone.

People will say if it ain't broke don't fix it. The Air Force isn't broken, but it is worn down—and it's nowhere near as ready and resilient as it should be. Much of the past two decades have been spent dismantling the force that made other nations stand back in awe in the 1990s. What made that Air Force so good was the training of its people and the quality of its modern gear: Stealth, precision, satellites, communications, remotely piloted drones, and other kit rival nations could only dream of. Now those things are almost commonplace.

America and its Air Force can regain advantage. Achieving 1990s-style overmatch should be a national priority.

ROLLS ROYCE

POWER TO PROTECT AND PRESERVE AMERICAN FREEDOM

As the world's most advanced military, the United States armed services strengthen global security. Built on a legacy of innovation, Rolls-Royce engines have been powering US military aircraft in every major conflict since World War I. Today, American-made Rolls-Royce engines provide power and propulsion excellence for the modern USAF warfighter. From the C-130 to the CV-22 and Global Hawk, our proven engines enable vital 24/7 humanitarian and security missions when and where it counts. Rolls-Royce is proud to provide the power to protect and preserve American freedom.

STRENGTHENING GLOBAL SECURITY.
DELIVERING **POWER AND PROPULSION** EXCELLENCE.

rolls-royce.com/us

LETTERS

Rare Air

In regards to the article "Drone Hype and Airpower Amnesia," July/August, p. 46, Drones are not going to replace the need for air superiority by aircraft. When the mission is Operation Midnight Hammer, drones won't be able to do the job. Strategically, airpower is essential. However, drones have been absolutely revolutionary in parts of the tactical world.

Billy Mitchell demonstrated that battleships were obsolete with his aircraft. Drones in Ukraine are demonstrating that tanks and armored vehicles are essentially obsolete. Despite having a 4 to 1 advantage in tanks/armored vehicles, the Russians rarely attack with them because of the detection and destruction due to small drones.

Drones are revolutionary. They have essentially replaced artillery in the Russia-Ukraine war because of their precision. Furthermore, the numbers of drones are staggering. In 2024, Ukraine produced 2 million drones and in 2025 the estimate is for 4 million drones. While EW is causing most drone losses by cutting the comm link, wire-guided drones and autonomous drones could change this.

Personally, I think the U.S. military is underestimating the present power of drones and potential future power. The Russians underestimated drones at their air bases with bombers. The U.S. military (Army-Navy-Air Force) needs.

Mission Accomplished

Operation Midnight Hammer [July/August, p. 20] will go down in history as one of the best Air Force operations ever. It demonstrated global reach and lethal weapons used against a very difficult target. Well done. Everything was well done: aircraft design, weapon design, aircrew training, ground crew training, and coordinated action by all the Air Force elements from refueling to air defense suppression to battle management. Peace through Strength.

William Thayer
San Diego, Calif.
(2nd entry)

WRITE TO US

Do you have a comment about a current article in the magazine? Write to "Letters," *Air & Space Forces Magazine*, 1201 S. Joyce St., C6, Arlington, VA 22202-2066 or email us at letters@afa.org. Letters should be concise and timely. We cannot acknowledge receipt of letters. We reserve the right to condense letters. Letters without name and city/base and state are not acceptable. Photographs cannot be used or returned.

Watchful Eyes

As flight leads we were always watchful and leery of our wingman during flights. With the new collaborative combat wingman approaching reality.

You can almost hear the human flight lead saying, "What's it doing now!"

Col. Clyde Romero,
USAF (Ret.)
Marietta, Ga.

Sacrifice

The article "Bob Lodge and the Making of Air Force Vietnam Aces" [May/June, p. 28] points out that the greatest assets we have to defend our national interests are the out-of-the-box thinkers such as Bob Lodge, and as referenced, the then Col. Robin Olds. Creative, tenacious, bold, and brave!

The article did not mention his awarded Silver Stars and Distinguished Flying Crosses. It also did not mention whether or not Major Lodge was ever considered for the Medal of Honor? If he wasn't, should he not be? Willingly sacrificing his life to save others should qualify him, wouldn't you think? Our Association should lobby for this.

Lt. Col. Tezeon Wong,
USAR (Ret.)
Newbury, Ohio

INDEX TO ADVERTISERS

Boeing	Cover II
Bombardier	33
CAE	Cover III
David Clark	31
GA-ASI	Cover IV
Forrest T. Jones	51
Highland Engineering	25
Jobs Ohio	45
Marvin Test	9
M1	7
National Cold War Center	29
Omni Defense Tech	21
Rise8	5
Rolls-Royce	3
SandboxAQ	63
USAA	55

Air & Space Forces Association

1201 S. Joyce St., C6 • Arlington, VA 22202-2066

afa.org
Telephone: **703.247.5800**
Toll-free: **800.727.3337**
CyberPatriot Competition: **877.885.5716**
StellarXplorers: **703.914.3066**
Mitchell Institute**: 703.914.3702**

AFA's Mission

Our mission is to promote dominant U.S. Air and Space Forces as the foundation of a strong National Defense; to honor and support our Airmen, Guardians, and their Families; and to remember and respect our enduring Heritage.

To accomplish this, we:

- **Educate** the public on the critical need for unrivaled aerospace power and a technically superior workforce to ensure national security.

- **Advocate** for aerospace power, and promote aerospace and STEM education and professional development.

- **Support** readiness for the Total Air and Space Forces, including Active Duty, National Guard, Reserve, civilians, families and members of the Civil Air Patrol.

Email Contacts

CyberPatriot ..... **info@uscyberpatriot.org**
Field Services. .... **field@afa.org**
Insurance .... **jsiegel@afa.org**
Membership. .... **membership@afa.org**
News Media. ... **communications@afa.org**
StellarXplorers ....**info@stellarxplorers.org**

Magazine
Advertising. ....**sales@afa.org**
Letters to Editor Column. ...**letters@afa.org**

Change of Address/Email

In an effort to stay connected with AFA and your local chapter, please update your mailing and email addresses. Change of address requires four weeks' notice.

To update your contact information:

- **Email:** membership@afa.org
- **Visit:** The Members Only area of our website, afa.org
- **Call:** Our Membership Department at 1-800-727-3337

Mail your magazine label, including your first and last name, to our Membership Department at 1201 S. Joyce St., C6, Arlington, VA 22202-2066.

34,000 OPERATOR HOURS SAVED
USSF

50% FASTER DELIVERY OF MISSION CRITICAL SOFTWARE
USSF

WE SHIP OUTCOMES

ATO TIME REDUCED 84.7%
VA

75% FEWER MISSION SCHEDULING ERRORS
USAF

The mission doesn't wait—and neither do we. We work shoulder-to-shoulder with your team, delivering secure, resilient software into real operations earlier and more often. It's not about shipping features; it's about delivering outcomes in production that change behaviors: faster decisions, more capable operators, and missions completed with confidence.

Because when the mission is on the line, just shipping software isn't enough. We ship outcomes.

WESHIPOUTCOMES.US

RISE8

By John A. Tirpak

A New Bomber Era Arrives

When the U.S. attacked Iran's nuclear development facilities in June, more than 130 fighters played a crucial supporting role. But the seven B-2 stealth bombers—flying direct from the U.S. heartland—were indisputably the heart of the operation, each delivering two monster conventional bombs designed to penetrate deeply buried and hardened targets. The mission underscored that the bomber is again assuming a central role in the application of American airpower, and that a shift in balance between bombers and short-range systems may be overdue.

Signs of the bomber's resurging importance are reflected in a number of other developments:

■Combatant commanders (COCOM) are demanding more bomber presence and bomber task forces (BTFs) in their theaters to show the flag, reassure partners and allies, demonstrate the flexibility of airpower, and conduct strikes.

■Congress has funded increased production capacity for the new B-21 bomber.

■Despite cost overruns, the Air Force and Congress remain committed to a massive overhaul and life extension of the B-52.

■Global Strike Command (GSC) is adding end strength to cover its rising responsibilities, including more bombers.

■Some bombers are being brought out of retirement to keep up with the demand.

Since early 2024, "I have seen more activity and more demand signals for bombers than I have seen probably in the last, at least, five to 10 years," said Gen. Thomas Bussiere, head of Air Force Global Strike Command, in a July interview. Bussiere has been nominated to be the Air Force's next Vice Chief of Staff.

The demand for bombers is "unyielding," he said.

There is a growing "realization of the value and prominence of long-range strike and the ability to hold at risk anything on the planet at a time and place of our choosing," Bussiere asserted.

To address that need, a greater buy of B-21s should be considered, he said, not only because of "the urgency to replace our aging bombers and the increased cost and challenges of sustaining a legacy bomber fleet" but a "world environment that, quite frankly, everybody looks at and says, 'we need more long-range strike, not less.'"

The demand for bombers "to deter in peacetime—including bomber task forces—and conduct long-range strikes in war now far outstrips the capacity of the current force," said Mark Gunzinger, director of future aerospace concepts and capability assessments at AFA's Mitchell Institute for Aerospace Studies.

"We have a raid-size, not a campaign-size bomber force," Gunzinger said. "And this demand is growing, even as the bomber force continues to shrink because of budget-driven retirements."

The Air Force fields 140 bombers of three types today. In 1990, just before the end of the Cold War, its bomber fleet numbered more than 500 aircraft.

The bomber force can't be structured to carry out merely one-off raids, said Maj. Gen. Jason Armagost, commander of 8th Air Force.

"I can never assume that any single strike is going to be enough," he said on a Mitchell Institute webinar in August.

After the Iran mission—Operation Midnight Hammer—the Air Force had to be "ready for … the next problem to be confronted," he said, but regrouping for comparable action right away wouldn't have been easy. Had there not been a cease-fire "about 30 hours after the strike," the Air Force might not have been able to mount a similar-sized follow-up. "You can't count on" a rapid end to hostilities after one such operation, he observed.

Staff Sgt. Joshua Hastings

A B-2 Spirit departs Whiteman Air Force Base, Mo., in August. The 509th Bomb Wing and its fleet of B-2s serve as part of the U.S. Air Force's conventional and strategic combat force with the capability to project U.S. airpower anywhere around the world.

Midnight Hammer illustrated that "there's a reversion to first principles of airpower," Armagost said, "where mass matters, where capability matters, and where the ability to do something is not innovated out of nothing."

The shortfall in long-range strike is the result of budget-driven, not threat-driven, reductions, he said.

"On the bomber side, we're sitting at a 'banquet of consequences,'" Armagost observed, "of decades, now, of force reduction" in an effort to be efficient. This has collided with the new spike in demand, "particularly over the last two years."

RISING DEMAND SIGNAL

Bussiere said bomber task forces have been dispatched around the world 48 times during the past 18 months. Since 2018, the Air Force has sent bombers in pairs and small groups to locations as far flung as Australia, South Korea, and Sweden. The short-notice, and usually short-duration deployments, highlight the bomber's ability to appear quickly—and usually, unexpectedly—operate with local forces and move on to new locations, sometimes through several COCOM areas of responsibility on a single deployment.

Among the missions Bussiere mentioned were "eight no-notice activations" involving all three operational platforms—the B-1, B-2 and B-52. Those included six instances where the bombers flew somewhere to "do destruction on behalf of their nation." Most of those had to do with attacking the Houthis in Yemen, which have been targeting shipping and aircraft around the Arabian Peninsula. But other BTFs have flown into hotspots like the South China Sea, the skies near the Korean Demilitarized Zone, and all around Europe.

Global Strike Command (GSC) deployed six B-2 stealth bombers to Diego Garcia for months this year, both to conduct operations against the Houthis in Yemen and to "message" Iran. Bussiere acknowledged that it was one of the longest and largest deployments of the stealth aircraft ever.

Bombers send "a very distinct and unique message" to foes and allies alike, Bussiere said, one that even a squadron of fighters can't match. They are associated with the ability to inflict mass destruction with either conventional or nuclear weapons, and their movements

M1 MISSION FIRST

M1 is a mission-first, force-multiplying partner providing aviation solutions to maximize capabilities, increase readiness, and enhance effectiveness. M1 provides a complete spectrum of services, including MRO, flight operations, training, aircraft modifications, and upgrades. The only company of scale focused *solely* on aviation services, we execute large, complex programs supporting the most advanced military aircraft in the world. M1 has delivered high-quality solutions to the USAF for more than two decades, earning a reputation for **exceptional performance, impactful innovations,** and **unparalleled partnership.**

Visit M1 at AFA's Air, Space & Cyber Conference, September 22-24, 2025, at the Gaylord National Resort & Convention Center, Booth #123.

LEARN MORE AT
WWW.M1SERVICES.COM

get noticed. Allies and partners "love to train [with] and integrate with our bomber force," he said.

To cope with increased demands, Bussiere said GSC will need more manpower. Plans call for an increase in end strength of 15 percent by 2030, although some of that will cover new systems like the Sentinel missile and a flying command post.

There have been several reductions in the B-1B force in recent years. Most of these were driven by long wings-extended missions during the Afghanistan and anti-ISIS campaigns, which stressed the aircraft in ways never intended and created maintenance challenges. But the platform remains extremely capable and can carry a larger payload than either the B-2 or B-52.

To preserve the fleet's capacity, a couple of B-1Bs have been regenerated from the Davis-Monthan Air Force Base, Ariz., "Boneyard" in recent years to replace aircraft lost in accidents, one to a fire in April 2022 and another condemned after a January 2024 crash.

"There's still a few left in the Boneyard that we could potentially pull out if needed," Bussiere said. In 2021, the B-1 fleet was reduced from 62 to 45 aircraft; those retired were the most problem-prone ones. The savings of taking them out of service has been applied to spare parts and maintainers to keep the remainder in good shape until the B-21 arrives.

The B-52—the newest of which was built in 1962—is getting a massive overhaul which will convert the fleet from B-52H to B-52J configuration. This entails a $15 billion replacement of its original engines with more fuel-efficient and reliable power plants, as well as a $3.4 billion upgrade of its radar, with other structural, communications, and networking improvements in the pipeline. Despite overruns on the radar upgrade, Congress still supports it, but it has directed greater oversight and firmer timelines from the Air Force.

BRING ON THE B-21

The B-21 Raider will be joining the fleet in the next few years, and there will be a transition period in which GSC will operate four bomber types—the B-1, B-2, B-21, and B-52—before necking down to just the latter two.

A second B-21 will join the test fleet soon, Bussiere said, but the conditions defining what will constitute initial operational capability for the new bomber are classified. However, the B-1 and B-2 are notionally expected to retire circa 2031-2032, before operational B-21s enter the fleet.

This budget season, Congress approved spending $4.5 billion to accelerate and/or expand production capacity for the B-21, although it didn't spell out any planned increases to the buy objective. Since 2018, the Air Force has said the buy should be "at least 100." The actual rate of production is classified, but is believed to be about seven per year; a number deliberately set small at the program's 2015 inception to protect it from budget cuts.

Congress' move to expand production expansion was "not a surprise," Bussiere said.

"We have been studying this now for a little over a year. We have great understanding on the capability, capacity, and cost to … increase the ramp rate."

Bussiere thinks the Air Force should consider buying 145 B-21s, but the "at least 100" figure is still the official target. He testified in May to the Senate Armed Services Committee that since that objective was set in the mid-2010s, the strategic environment has changed: China has deployed air-launched ICBMs on some of its bombers and built hundreds of silos; Russia invaded Ukraine; North Korea has built up its nuclear arsenal.

Gen. Anthony Cotton, head of U.S. Strategic Command, has argued for 145 B-21s as a more appropriate number, one that Bussiere agrees should be studied. Combined with 75 B-52s, that would give the Air Force a fleet of 220 bombers by the mid-2030s, compared with 140 today.

A "steeper" B-21 ramp rate, Bussiere said, would allow the Air Force to more rapidly modernize the bomber fleet. He doesn't think the B-21 would become a bigger budget-cutting target as a result, because the program is doing well and he's "very happy" with its progress.

More B-21s would "help rebuild deterrence this decade, when the potential for Chinese aggression may be greatest," Gunzinger said, adding, "I think DOD and the Congress are beginning to understand the value of accelerating B-21 acquisition."

He noted, too, that long-range strike "is one of our military's greatest shortfalls, and it is a shortfall that Army, Navy, and Marine Corps strike systems cannot fill." The long-range hypersonic systems the Army and Navy are developing will cost $40 million or more per shot, versus $50,000 or less for a satellite-guided bomb dropped from a bomber.

"It's simply math," Gunzinger said. Bombers are the economical approach "from a cost-per-effect perspective."

KEEP THE OLD IRON

In an upcoming Mitchell paper, "Strategic Attack: Maintaining the Air Force's Capacity to Deny Sanctuaries," Gunzinger and co-author Heather Penney argue that "it makes a great deal of sense to keep all remaining B-2s and B-1s in the force until at least 2035," and still buy B-21s at an accelerated rate. Doing so would also "hedge against unforeseen … problems" with the B-21, he added.

In the paper, the authors argue that the Air Force has a "once-in-a-generation opportunity to rebuild its sanctuary-denial capacity" that the rest of the force and U.S. allies depend on.

To prevail in a Pacific war, the U.S. must be able to strike at Chinese home-based missile-launchers, they write. Only the B-21 and other sixth-generation aircraft will be able to "penetrate highly contested environments over long ranges to deny sanctuaries to China's military."

The authors said their analysis and those of others have determined that a 300-aircraft bomber fleet is needed to deter China. That number would assure that a credible tempo of long-range strike operations can be flown in wartime and also be able to strike China's numerous missile launchers before they can launch massive barrages at U.S. forces. Gunzinger and Penney urge Congress to provide the Air Force with the resources to buy "at least 200 penetrating B-21s, as rapidly as possible" in order to "reduce the risk of losing a conflict with China."

The B-2s should be retained "until a sizable force of B-21s—surpassing 100 aircraft—are fully operational in the 2030s," the authors say. The B-2, they note, is the only in-hand stealth bomber capable of penetrating "high-density air threats and striking the most challenging mobile, fixed, or hardened/deeply buried targets." Retiring B-2s "prematurely" would increase the risk that the PLA or other militaries could knock out or "greatly degrade" U.S. forces early in a conflict, they said.

They also urge the Air Force to conduct a "cost-per-effect analysis" to help set "a balanced mix of long-range penetrating and stand-off combat aircraft and munitions." That analysis should factor in "the whole system-of-systems that long-range kill chains require to be resilient and effective at the scale needed in a peer conflict."

This potential rebalancing was raised by former Air Force Secretary Frank Kendall more than two years ago. In May 2023, Kendall told the Senate Armed Services Committee that he's not sure "the future Air Force will look all that much like the one we have today" because he sees "a shift in the balance between shorter-range tactical air capabilities and longer-range strike capabilities that bombers provide."

In January of this year, Kendall emphasized the point in an interview with Air and Space Forces Magazine. The force, he said, "is somewhat out of balance right now" between long-range and short-range investments, because short-range aircraft require vulnerable forward bases and tankers that bombers do not.

Though it would take some time for Northrop Grumman to spool up to a higher B-21 production rate, it would be "well worth considering" doing so, considering the "flexibility you have with the bomber force," Kendall said.

Globally Deployed, Combat Proven

Revolutionizing armament test today and tomorrow

Which would you rather carry to the flightline?

MTS-3060A SmartCan™

Integrated by Design

The ACE and Mission-Ready Airmen Enabler

- Rugged, handheld, powerful, rapid test
- Reduced training and logistics footprint
- Deployed on 14 platforms / 21 countries
- Smart and legacy weapons systems support
- Eliminates multiple O-Level armament test sets
- Commercial Item; OEM/USAF SERDed

MARVIN TEST SOLUTIONS

MARVINTEST.COM

© 2025 The Marvin Group. All rights reserved. Product and trade names are property of their respective companies.

AIRFRAMES

Readiness begins on the ground. Getting aircraft airborne starts with the little things: parts, fuel, and practice. Staff Sgt. Hunter Allison and Senior Airman Andrew Wright of the 23rd Logistics Readiness Squadron took part in a Distributed Integrated Combat Turn exercise in July, proving they could simultaneously rearm and refuel multiple fighter jets in under 90 minutes.

Timothy Koster

Senior Airman William Finn V

Pilots downed over the Pacific Ocean during World War II could float for weeks before being rescued—if they didn't first succumb to the elements. Today, some argue conventional helicopter rescue may not be feasible in contested waters in a peer conflict with China. Others see uncrewed systems as the future of rescue operations. Either way, Airmen sent into harm's way must prepare for the worst in order to survive. Red Flag-Rescue 25-3, held in August off the California coast, simulated rescue scenarios to build a more resilient force.

EJ Hersom/DOD

Air Force Secretary Troy Meink spent the past 13 years working classified programs in the secretive National Reconnaissance Office. Now he's in charge of the Air Force and Space Force.

Meet Troy Meink

The new Air Force Secretary sits down for his first on-the-record interview.

By Greg Hadley

Growing up, Troy Meink wanted to be a pilot, then an astronaut. He joined the Air Force, but his eyesight wasn't up to pilot standards, and the pilot dream was dashed. He began as a navigator, shifted into acquisition and space. He built airplanes in his garage and spent the better part of two decades buying, operating, and developing space systems.

Not surprisingly, this new Secretary of the Air Force is enjoying the heck out of his new role.

“I couldn’t ask for a better job than the ones I have right now, from just an interest perspective,” Meink told Air & Space Forces Magazine in his first interview since becoming Secretary in May.

Tieless, in an unclassified conference space adjacent to his Pentagon office, Meink comes across as curious, studious, thoughtful, and still just a little bit surprised to find himself in an office typically occupied by former politicians, mega donors, and titans of industry. He’s better described as a career technocrat who spent 13 years in the secretive, almost invisible world of the National Reconnaissance Office, nearly the last five years as deputy director. Other stints included the Air Force Research Lab and Air Force Space and Missile Systems Center, now a part of the Space Force as Space Systems Command.

“Air and space are becoming probably as important—if not more important than anytime since the formation of the Air Force back in ’47. ”
—Secretary of the Air Force Troy Meink

Yet while Meink is instantly the most space-experienced executive ever to serve as Air Force Secretary, he is not going to stand by and be seen as ’the “space” Secretary.

“I would say I’m as much of an airplane person as I am a space person,” he said. His time as a KC-135 navigator was formative and he continues to tinker with aircraft in his garage. He flies an experimental, homebuilt RV-8.

“My love from day one was aviation, and then I wanted to be an astronaut,” he says, tapping his glasses, the reason neither dream came true. The convergence of those interests in the Department of the Air Force comes at what he sees as a defining moment.

“Air and space are becoming probably as important—if not more important than anytime since the formation of the Air Force back in ’47—and then, of course, the Space Force, they’re taking on new missions that didn’t exist five to 10 years ago,” Meink said. Then, echoing sentiments offered by his predecessor, Frank Kendall, when he took the job four years ago, he added, “And the opportunity to help steer, solve some of the problems, push forward, increase our capability, not only within the department, but to the entire joint force, it’s just a fantastic opportunity. There’s no way I couldn’t be excited about that.”

Meink’s first message to the force in May zeroed in on the challenge: the need for sweeping modernization for the future and improved readiness right now. That’s a lot.

“We have a rapidly evolving threat, so we’re trying to maintain readiness against that threat today, but [concurrently] conduct the largest modernization effort since the Air Force was founded.”

Though Meink spent years in acquisition and might seem perfectly attuned to modernization’s cost, schedule, and delivery challenges, it’s readiness that has caught his attention first and foremost. Asked what has surprised him most in his first three months, he didn’t hesitate: “the readiness challenges.”

“We’ve gotten ourselves in trouble a little bit with, ’OK, well, we’ll back off on readiness a little bit, a little bit more, and face modernization a little bit more and more.’ And so we have to rebalance.”

“I knew going in, I’ve been in the government a while, and so I have a fairly good understanding of what’s going on, at least at a high level,” he said. “And I knew there were readiness challenges within the department. I didn’t realize this is probably quite as big a challenge as it is.”

Aging airplanes, parts shortages, the loss of experienced maintainers, fewer flying hours—all have contributed to an overall readiness decline. Meink intends to make strong, steady investments in spare parts, logistics, training, and more to turn that trend around.

“I would argue that probably over the last 10-plus years, readiness was not properly funded, and we dug ourselves into a pretty big hole,” he said. “We’re trying to dig ourselves out of that hole.”

Doing so will take years, he said, expressing gratitude that both the Department of Defense and Congress seems supportive.

Renewing the fleet is a separate, parallel challenge. Meink ticked off the list of major new programs underway, the B-21 bomber, the Sentinel intercontinental ballistic missile, the Collaborative Combat Aircraft, a new nuclear command, control, and communications system, and the F-47 fighter, all of which come on top of ongoing programs like F-35 fighter and KC-47 tanker.

NRO earned a reputation for innovative, effective acquisition, and Meink stressed the need for applying similar discipline and efficiency in his new role.

"We have to improve execution,” he said. “We’ve had some good execution, we’ve had some not good execution, and we need to make sure we are being good stewards of taxpayer dollars, and we are executing, executing, executing, because we can’t afford massively overrun, delayed programs.”

He commended planners for the work so far on two of the biggest programs: “I’m excited about F-47,” he said, citing work prior to his arrival. “I’m hoping to keep it in place and structure the program well so that we can be successful. The B-21 is another good example. But we need that kind of performance across the entire department.”

Sometimes readiness and modernization go hand in hand. Higher-than-expected sustainment costs have plagued the F-35 since its inception, undermining confidence among lawmakers even as pilots rave about its advanced capabilities.

“The F-35 has been a challenge from a readiness perspective,” Meink said. “The pilots love the airplane. It’s a great airplane. ... The challenge is, we’ve just got to increase the readiness on the jet, and we have to work with the contractors, and maybe even [do] some R&D on increasing how reliable the parts are, how reliable the aircraft is to maintain, to make sure we can employ that combat power.”

F-35 mission capable rates have held stable over the past year but remain only about 52 percent. Historically, the Air Force strived for 80 percent.

"We never got the performance, from a reliability perspective, that we were initially planning for,” Meink said. “So it wasn’t just [that] we underfunded. We were actually planning for everything to last longer before it needed to be maintained,” he said. “So we need to fix both, right? We need to work with the contractor. We need to address some of those reliability issues, and then we need to make sure we’re funding the number of parts.”

Meink will have his hands full fighting for the funds to do that, but he projected confidence that the department will get the resources it needs.

“Both the President and his administration and Congress in the last budget have been helpful,” Meink said. “They are increasing our budget, trying to go after some of these things. ... But that’s going to have to continue going forward, as we try to maintain this readiness at the same time we’re modernizing the force—and then making sure we have the people to do that.”

Talent is another concern. Interviewed in August not long after returning from a swing through Hawaii, Guam, the Philippines, Japan, and Alaska, Meink praised the hard work of Airmen and Guardians but also came away thinking that some things they were doing were harder than they need to be.

“I’ve been Active duty, I’ve been around Airmen and Guardians, [yet] they are even more impressive than I thought,” Meink said. “The ability to operate in those harsh environments, in that part of the world, with unimproved runways and operation areas: That was really impressive, really, really impressive.

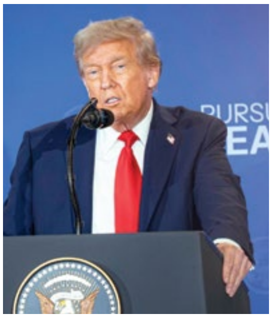
“But at the same time, you could see that the readiness just wasn’t there. They were struggling with things they should not have been struggling with. So we need to improve that.”

One reason they’re struggling is because they are continuing to squeeze life out of aging gear. At Andersen Air Force Base on Guam, the Secretary took note of a KC-135 that looked extra familiar: he’s pretty sure it was one he helped crew as a navigator more than 30 years ago.

“It looked beautiful,” Meink said. “It was a Guard airplane, and they really maintained that airplane well. That’s one of the challenges: I never flew an airplane younger than I was when I was Active duty, and that airplane is still the basis of our air refueling fleet. Now, it’s a great airplane, but that tells you how old a lot of the fleet is getting, which is why both readiness and modernization are critical.”

Meink will kick off AFA’s Air, Space & Cyber Conference Sept. 22 with a keynote before the biggest audience of his career. He’ll also hold his first press conference. He’ll never be an astronaut and he’ll never pilot an Air Force jet. But the former navigator is charting a course for the military branches under his direction, and more than 700,000 Airmen and Guardians comprising those forces. He controls budgets approaching a quarter of a billion annually, enough, he hopes, to make a difference.

Thinking Out Loud



Benjamin Applebaum

"It is very difficult, if not impossible, to win a war without attacking an invader's country. It is like a great team in sports that has a fantastic defense but is not allowed to play offense. There is no chance of winning! That is how it is with Ukraine and Russia."

—President Donald Trump in a Truth Social post Aug. 21. Whether Trump was suggesting he might lift restrictions on Ukraine, in effect warning Russia's Vladimir Putin of attacks to come, or chiding Ukraine's Volodymyr Zelenskyy over the effect of those restrictions was never clear.

Start Over

DOD

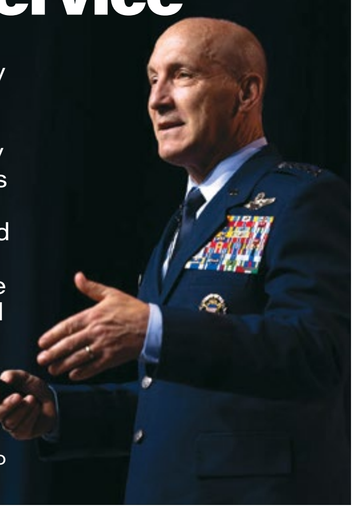
"JCIDS was in significant need of reform. The answer was, 'Let's just get rid of it and think of different ways to do the business.'"

—Vice Chairman of the Joint Chiefs Adm. Christopher W. Grady Aug. 27, on Secretary Pete Hegseth's decision to revamp the joint requirements and review process, the Joint Capabilities Integration and Development System.

Thank You For Your Service

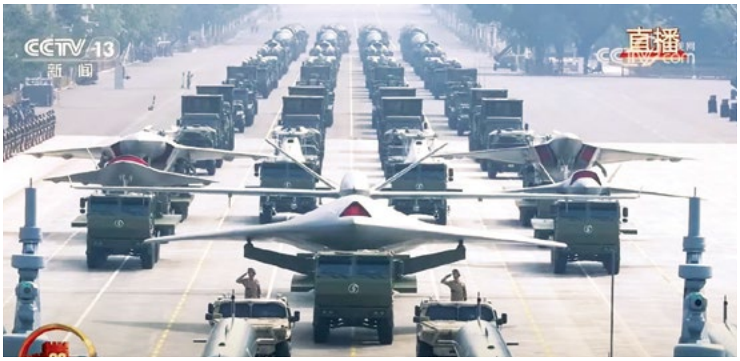
"I'm grateful for the opportunity to serve as the 23rd Air Force Chief of Staff and I'm thankful for Secretary Meink, Secretary Hegseth and President Trump's faith in me to lead our service. … More than anything, I'm proud to have been part of the team of Airmen who live out our core values of integrity, service, and excellence every day as we prepare to defend this great nation."

—Air Force Chief of Staff Gen. David Allvin on Aug. 18 announcing his plan to retire in November.



Jud McCrehin/staff

OBSERVE



CCTV screengrab

"The victory of the Chinese People's War of Resistance Against Japanese Aggression is the first complete victory won by China in its resistance against foreign aggression in modern times. … [It] re-established China as a major country in the world … opened up bright prospects for the great renewal of the Chinese nation and set our ancient country on a new journey after gaining rebirth. … The Chinese people will always remember what the people of other countries did for the victory of their War of Resistance. … Today, peace and development have become the prevailing trend, but the world is far from tranquil. War is the sword of Damocles that still hangs over mankind."

—Chinese Premier Xi Jinping on the 80th anniversary of Japan's defeat in World War I, Sept. 3, before 12,000 military troops took part in this year's Victory Day parade, a show of military force that included advanced weapons, ICBMs, and aircraft, before a host of foreign dignitaries, including Russia's Vladimir Putin and North Korea's Kim Jong Un.

The TV is Always On

"I thought it was very, very impressive, but I understood the reason they were doing it, and they were hoping I was watching. And I was watching."

—President Trump,
responding to questions about China's Victory Day parade held on Sept. 3.

Gear Up

"I truly believe that ACC is the heart and soul of our Air Force. We have a lot to focus on, but our primary focus must be on readiness—readiness of our aircraft, readiness of our aircrew, readiness to dominate the electromagnetic spectrum, readiness of all our Airmen and their families. … I'm not interested in arbitrary timelines or functional efficiency at the expense of warfighting effectiveness. We'll get a little bit better today, so we are a little more ready tomorrow."

—Gen. Adrian L. Spain after taking over as Commander of Air Combat Command, speaking Aug. 11 at Joint Base Langley-Eustis, Va.

SPACE REVOLUTION

"China has almost 1,000 satellites, we think, up in the orbits where they didn't 20 years ago. They have an ability to interrupt our signals across the globe—we have to assume that. And so I think that's a domain, the space domain, where this contest might even happen first, where they contest communications or ability to command and control before any shot gets fired. That's a potential. … We anticipate having this problem in a potential crisis … a contested environment that we haven't had to think about quite frankly since the Cold War."

—Army Lt. Gen. Joel "JB" Vowell, deputy commanding general of U.S. Army Pacific, speaking to reporters during a Defense Writers Group event [July 22].

FACES OF THE FORCE

Senior Airman Nicholas Paczkowski

Flooding from persistent July thunderstorms devastated the communities of Mescalero and Ruidoso, N.M., leading more than 90 Airmen from the **29th Attack Squadron** and **7th Air Support Operations Squadron** at Fort Bliss, Texas, to mobilize in support of the Mescalero Apache Tribe. Teams of Airmen cleared debris from waterways, organized clothing donations, and filled more than 500 sandbags to protect infrastructure, including the Mescalero Tribal Fish Hatchery, which lost 80 percent of its fish. "Seeing that many volunteers step up to help the tribe was nothing short of amazing," said Kyle Valdez, Mescalero Emergency Operations Center project manager.

Staff Sgt. Lauren Cobin/USAF

At 17 years old, a roadside sign, "Flight School Opening Soon," outside of a rural Minnesota airport sparked a dream that has taken U.S. Air Force **Capt. Nick "Laz" Le Tourneau** to the skies as commander of the F-22 Raptor Aerial Demonstration Team. The New York Mills, Minn., native, grew up with an interest in flying and air shows, meeting a recruiter at one of the shows made his mind up to pursue his dream. Tourneau now headlines air shows worldwide. "I just hope to inspire those kids out there to find something that excites them … and pursue it relentlessly," Le Tourneau said. In July, he returned home to headline the Duluth Air Show.

Staff Sgt. Ethan Sherwood/USAF

The **618th Air Operations Center** earned the 2025 Verne Orr Award from the Air & Space Forces Association for its innovative use of human capital to deliver rapid global air mobility. The award recognizes organizations excelling in human resources management. "This isn't just a win for us," said Brig. Gen. Cassius Bentley, 618th AOC commander. "It's a win for all of Air Mobility Command and the mobility enterprise." The Department of Defense's largest air operations center, the 618th AOC, oversees 24/7 global air mobility missions while driving advancements in technology, crew support, and Total Force development.

Staff Sgt. Ethan Sherwood/USAF

Secretary of the Air Force Troy Meink (center) and Chief of Staff of Gen. David Allvin (left) greet **CMSgt. Nathan Gershon, 618th Air Operations Center** superintendent, and 618th AOC commander **Brig. Gen. Bentley** in July at Scott Air Force Base, Ill.

Senior Airman Nicholas Paczkowski

The 635th Materiel Maintenance Group (MMG) has developed a unique wargame to enhance war reserve materiel readiness. **Col. Brandon S. Maroon**, 635th MMG commander, designed "BEAR Necessities" to train personnel in Basic Expeditionary Airfield Resources (BEAR) assets, which are critical to deployment missions. The wargame focuses on four phases: Resource, Readiness, Deployment, and Reconstitution. "The game's innovative design provides a no-fail, low-cost testing environment … and has proven to be an invaluable tool for addressing the complexities of readiness shortfall," Maroon said. The customizable game can be played alone, with others, or in a competitive mode.

Daniel Peterson/USAF

U.S. Air Force **Capt. Brian Banks**, a Reserve chaplain with the 88th Air Base Wing, Ohio, is one of the fastest 40-year-olds in the world after earning a Bronze Medal at the 2025 USA Track and Field Masters Indoor Nationals in the 60-meter dash. Banks, who started by getting his kids involved in track, also begun running in 2024. "I have this saying, 'stay in your yard.' I don't lock eyes with anybody. … I just focus on getting there faster than anybody else." Banks said. Alongside his competitive drive, Banks dedicates himself to guiding and supporting Airmen and their families as a chaplain, offering spiritual care and mental health support across Wright-Patterson Air Force Base, Ohio.

USSF

Space Force **Master Sgt. Allison Thodos'** military journey has taken her from serving in the Air Force Honor Guard to becoming flight chief, leading the intelligence analysis collections team at the National Space Defense Center (NSDC). After transferring to the Space Force in 2023, she embraced a new career as an intelligence analyst, where she oversees all collections at the NSDC. Thodos says the opportunity to work alongside "some of the smartest minds in the military" in the nation's newest branch has been both transformative and deeply rewarding. "I just wanted to be a part of something new and amazing, and very happy I have gotten that opportunity," she said.

PACE BASE DELTA

Keefer Patterson/USSF

Space Operations Command is emphasizing "community mindset" as one of 11 themes of the Year of the Company Grade Officer, building on last year's campaign Year of the NCO. The initiative encourages junior officers to foster resilience and mission readiness through teamwork, mentorship, and transparent leadership. "No one wins alone," said Capt. Ian Patterson, 21st Force Support Squadron Sustainment Services Flight commander. "Our community is our family. … We must rely on each other to be the most efficient and effective team possible." The campaign aims to strengthen organizational culture across the Space Force. There is no combat readiness without family readiness.

Tell us who you think we should highlight here. Write to letters@afa.org

Air Force Chief of Staff Gen. David Allvin announced he would retire in November, just half-way through the typical four-year term.

Senior Airman Violette Hosack

Allvin's Retirement Casts Shadow on 'Re-Optimization'

By Tobias Naegele

With his Aug. 18 announcement that he would retire this fall, Air Force Chief of Staff Gen. David Allvin ended months of speculation about his future and marked his tenure as among the shortest in Air Force history.

Allvin is among 14 general officers fired or retiring early since President Donald Trump took office in January and the fourth member of the Joint Chiefs of Staff to depart. Unique to the Air Force, however, is that Allvin's departure follows close on the heels of the firing of former Air Force Vice Chief of Staff Gen. James Slife in February. By effectively beheading the Air Force's military leadership, the new administration cast into doubt initiatives launched in the past two years intended to reshape the design, operations, and organization of the service.

Allvin and Slife were the military leaders on the small team assembled by Air Force Secretary Frank Kendall to lead a proposed revamp dubbed "Re-optimization for Great Power Competition," a collection of about two dozen changes intended to reset the Air Force to better deter or defeat China in the future. Some of those changes, such as Department-Level Exercises and the revival of warrant officers, could prove enduring.

But others, such as centralizing the requirements process within a new Integrated Capabilities Command (ICC), or reorganizing Air Force wings to present standardized force packages to combatant commanders, may not survive without the leaders who championed them. ICC and other re-optimization programs have been effectively on hold since early February, following an order from Defense Secretary Pete Hegseth.

Those ideas, along with Allvin's push to de-emphasize the Air Force's major commands, were unpopular among his fellow four-stars, particularly with the two leading contenders to replace him: Air Force Global Strike Command boss Gen. Thomas A. Bussiere, already nominated to succeed Slife as Vice Chief, and Gen. Kenneth S. Wilsbach, who recently departed as the head of Air Combat Command, but has not yet officially retired.

"The four stars who run [Air] Mobility Command, Global Strike, and Air Combat Command, in particular, kind of view themselves as somewhat quasi-independent," one former civilian official told Air & Space Forces Magazine. "They want to have a lot of authority over what happens in those stovepipes."

Global Strike Command oversees the Air Force's bomber and missile forces, two legs of the nuclear triad, and is responsible for both developing and manning the weapons and platforms. Air Combat Command has parallel responsibilities for the fighter force. That vertical integration is a strength, but Kendall also saw it as fueling disconnects between different parts of the force, particularly in systems' ability to communicate and share data in real time.

Kendall wagered the success achieved in his first two years on the job on a final drive to engineer and implement a more integrated approach to weapons development and other re-optimization changes. He dedicated his entire last year to seeing that through and believed the moves would endure after he departed.

"They're all about the heart of the matter of how we organize, train, and equip the force," he told reporters at AFA's 2024 Air, Space, & Cyber Conference. "The support goes down through the ranks. … I'm really not worried."

If there was support through the ranks, however, there was not support from the new administration. It took Hegseth barely two weeks to freeze those initiatives pending the arrival of a new Secretary and undersecretary of the Air Force. Now, with a new Chief of Staff coming on board, it is safe to expect that individual will also get a say on the future of those plans.

Air & Space Forces Magazine spoke with six current and former Air Force officials who were granted anonymity in order to speak candidly about sensitive matters. They said Allvin grew unpopular as he forged ahead in the face of opposition from his fellow generals, who saw the ICC and deployable combat wing initiatives as misguided and impractical. These critics say Allvin ignored operational input, sought to stretch the force too thin, and didn't do enough to prepare the service to face off with China.

"This is not the point in your career where you get to figure things out along the way," one retired general officer said. "This is the point in the career where you were hired for your wisdom, your intellect, and your ability to get things done."

Their complaints eventually reached civilian leadership, who gave Allvin the chance to retire rather than be openly fired, sources said. How Trump, Hegseth, or Air Force Secretary Troy E. Meink arrived at the decision remains unclear. The White House did not respond to a request for comment on Allvin's planned retirement. A Pentagon spokesperson referred questions to the Air Force, where another spokesperson declined to comment.

But conditions in the Trump administration were ripe for Allvin's unusual exit, sources agreed. Some suggested he could have bowed out on his own if his vision for the future didn't match that of the Trump administration, or if he saw a dead end looming after Trump nominated Bussiere—an officer sources said had clashed with Allvin—to be Vice Chief. Yet it seemed clear from Allvin's public comments and statements that he was working to align his initiatives to the administration's approach.

"We have seen a preference by this administration to want to put into key roles military leaders that they deem are fully aligned with what the administration is trying to accomplish," a second former civilian official said. "It seems that General Allvin has endeavored to align his approach in the Air Force to this administration's priorities, but perhaps the administration view is different."

Indeed, the tone of Allvin's social media and other communication changed with the arrival of a new administration. He tweeted about "warheads on foreheads" and at AFA's Air Warfare Symposium in March, he inserted a clip from Hegseth's confirmation hearing to demonstrate alignment with the new secretary's priorities. Later, after getting the go-ahead to declare a winner in the Next-Generation Air Dominance fighter competition, he designated the future jet the F-47, a reference to Trump as the 47th President of the United States.

Multiple former Air Force officials warned that dropping the programs pursued by Allvin, Slife, and Allvin's predecessor as Chief, Gen. C.Q. Brown Jr.—who Hegseth fired as Chairman of the Joint Chiefs of Staff in February—could undermine the service in the future. The former officials expressed concern about adequate budgeting and the ability to sustain operations like the June airstrikes on Iranian nuclear facilities, for example. The turnover could spur a new look at how much money the Air Force requests from Congress and how it's spent.

The short-term outlook may not change much; if China tries to invade Taiwan in 2027, as Chinese President Xi Jinping has told his generals to prepare for and as some U.S. officials believe is possible, deployable combat wings that could help defend the island nation would still be in their relative infancy. But risk to the U.S. grows the longer the Air Force puts off a major revamp, the first former civilian official said.

Removing senior military officers who have been instrumental in defining the future force "really undermines the bipartisan approach to China," the second former civilian official added.

The clock is ticking to name Allvin's replacement, and a nomination could come soon.

Wilsbach is a decorated fighter pilot experienced in the Pacific, including nearly four years commanding Pacific Air Forces prior to taking over ACC in February 2024. Wilsbach's wife Cynthia has worked in both Trump administrations, where she is now a senior writer for presidential correspondence, White House records show.

Bussiere, who as head of Air Force Global Strike Command was the top officer in charge of the bomber fleet when Operation Midnight Hammer struck Iran in June, is another possible contender for chief.

"Bussiere is a force of nature," the retired general officer said. "He is incredibly passionate. He has incredibly high standards. He's gruff, he's direct, he's got an enormous foundation of operational credibility. He's savvy, and he doesn't sit on an opinion just because it's counter to what the head of the table thinks."

Neither four-star is a fan of Integrated Capabilities Command or the design of deployable combat wings, sources said, making it more likely that those initiatives would be scrapped if either becomes Chief of Staff. As Secretary, Meink would ultimately have the final say in whether they move forward than the Chief of Staff.

In all, seven Air Force generals have been dismissed from top roles in the U.S. military since January—comprising half of the total general and flag officers ousted so far, and more than any other branch of the armed forces.

In addition to Brown, Allvin, and Slife, the list of Airmen dismissed by the Trump administration (from most recent to earliest) include:

■ Defense Intelligence Agency Director Lt. Gen. Jeffrey Kruse: Fired Aug. 22, possibly because a leaked preliminary assessment of limited damage to Iranian nuclear sites clashed with Trump's view, according to the Associated Press.

■ U.S. Cyber Command and National Security Agency boss Gen. Timothy Haugh: Fired in the spring. Right-wing activist Laura Loomer appeared to take credit for his ouster with a social media post suggesting Haugh had ties to the Biden administration and Army Gen. Mark Milley, Brown's predecessor as Chairman of the Joint Chiefs.

■ Lt. Gen. Jennifer Short, the senior military assistant to the Defense Secretary: Fired in March when Hegseth sought a new military aide.

■ Judge Advocate General of the Air Force Lt. Gen. Charles Plummer: Fired by Hegseth in February, along with his counterpart in the Army, in a bid to install lawyers aligned with the Trump administration's objectives

Air Force Gen. Dan Caine replaced Brown as the military's top officer. Bussiere is nominated to replace Slife, and Short retired. Haugh's deputy, Army Lt. Gen. William J. Hartman, is now acting head of CYBERCOM; Plummer's replacement has not yet been named.

Though it's too soon to tell how removing Airmen from key joint positions could shape the service's influence on military operations, the second former civilian official argues Congress should probe the potential impact that axing more than two dozen Senate-confirmed officers might have on the services.

Others argue the Air Force remains stable and the Airman's perspective in the joint force prevails.

"The reality is, military organizations are used to people coming and going at unexpected times and in unexpected ways," the retired general officer said.

Allvin's early departure makes his tenure among the four shortest among the 23 Chiefs of staff since 1947 when the service was founded. The only shorter tenures were those of the first Chief, Gen. Carl A. Spaatz, who had run the Army Air Forces prior to the Air Force's independence and who held the job for only about nine months; Gen. George Brown, who was promoted to become Chairman of the Joint Chiefs of Staff after less than a year as CSAF; and Gen. Mike Dugan, who was fired after less than three months on the job in September 1990 for telling reporters how he expected the Iraq war might be waged.

Allvin will become the fourth CSAF to depart early in the past 35 years—totaling about one-third of the 11 Chiefs in office since 1990. In addition to Dugan, Gen. Ronald Fogleman resigned over a dispute with Secretary of Defense William Cohen in 1997, and Gen. T. Michael Moseley was fired in 2008 by Defense Secretary Robert Gates over the Air Force's mishandling of nuclear weapons and his insistence that the Air Force invest in high-end capabilities to fight peer threats in the midst of low-end counterinsurgency conflicts in Iraq and Afghanistan.

In contrast, Chief of Naval Operations Adm. Lisa Franchetti and Coast Guard Commandant Adm. Linda Fagan were the only other Chiefs fired or who retired early from the top of any U.S. military service during that same period. The Trump administration ousted both women within weeks of taking office.

Rachel S. Cohen contributed to this story.

AIR

Spain Takes Charge at ACC

By Chris Gordon

Gen. Adrian L. Spain succeeded Gen. Kenneth S. Wilsbach Aug. 11, marking his ascension to the four-star ranks at one of the Air Force's largest and most far-reaching commands.

In a ceremony presided over by Air Force Chief of Staff Gen. David W. Allvin, just a week before he announced his intended retirement, the Chief emphasized the need for fighter aircraft and air superiority in the face of growing threats from China in the Pacific and its ally, Russia, in Europe.

"We have continuously looked at the aggression and the coercive activities of the People's Republic of China—that arc has not changed," Allvin said. "After February [2022], when Russia invaded Ukraine, people started talking about how maybe air superiority was obsolete, it didn't matter anymore, the battlefield had changed—not recognizing that it was the inability or the unwillingness to appropriately apply airpower that was as much the cause of that as anything."

Chris Gordon/staff

Gen. Adrian Spain, right, replaced Gen. Kenneth Wilsbach (center) as commander of Air Combat Command, as Air Force Chief of Staff Gen. David Allvin congratulated them both.

Wilsbach echoed the concerns and the idea that flexibility has always been a central facet of airpower. "We can't just be a one-trick pony," Wilsbach said. "We've got to be able to be agile and move to where the requirements of the globe matter."

Spain, whose prior role was Air Force deputy chief of staff for operations—known as the A3—played a central role in developing the Air Force's force management and training policies. Following the firing of former Air Force Vice Chief of Staff Gen. James Slife, he was the principal voice on the service's readiness and modernization initiatives on Capitol Hill.

Air Combat Command is at the forefront of important Air Force doctrinal shifts, such as agile combat employment (ACE). Though ACE is a servicewide initiative to be able to operate in a more dispersed manner—primarily in the Pacific—Air Combat Command's fighters are permanently based in the United States and deploy overseas.

"I truly believe that ACC is the heart and soul of our Air Force," said Spain, a career F-22 and F-15 pilot who has spent around half his career in ACC. "We have a lot to focus on, but our primary focus must be on readiness—readiness of our aircraft, readiness

OMNI
SKYDRATE
OMNI DEFENSE TECH

SKYDRATE

USAF PROGRAM OF RECORD

FULLY-AUTOMATED
HANDS FREE

*Actual Size

A CRITICAL EDGE IN THE COCKPIT

THE PIONEER OF INFLIGHT BLADDER RELIEF TECHNOLOGY.

*REQUEST **SKYDRATE** FROM YOUR SUPPLY CHAIN TODAY!*

CERTIFIED SAFE-TO-FLY
AIRWORTHINESS APPROVED
ON ALL **USAF AIRCRAFT**

Visit **skydrate.pro** to learn more.

of our aircrew, readiness to dominate the electromagnetic spectrum, readiness of all our Airmen and their families. … I'm not interested in arbitrary timelines or functional efficiency at the expense of warfighting effectiveness. We'll get a little bit better today, so we are a little more ready tomorrow."

Air Combat Command comprises more than 100,000 Airmen, 1,000 aircraft, and two dozen wings. Allvin's vision tasked the command to have a special cross-functional role in improving readiness across the force. In May, ACC said it was changing how it measures and tracks fleet readiness, aiming to simplify the way it tracks and communicates the material condition of its airplanes with a system dubbed "Readiness Informed Metrics."

RIM relies on three key numbers for each individual command level: Total aircraft; the number of aircraft needed to fulfill operational requirements; and the number available to meet those requirements. At the time, ACC Director of Logistics, Engineering, and Force Protection, Brig. Gen. Jennifer Hammerstedt, told Air & Space Forces Magazine RIM "really helps at the strategic level" to define a command's ability to field forces "tail by tail, and go … 'OK, we've got X number of aircraft down for maintenance. What are we doing? What is our plan? It kind of just jumps out a little bit differently."

ACC also has been charged with leading increased training across the Air Force, expanding major exercises into Department-Level Exercise events. And it is the lead command developing Collaborative Combat Aircraft and the future sixth-generation F-47 fighter.

"The work the Chief and the Secretary [of the Air Force Troy Meink] are doing to focus on our foundational readiness is substantial, and it's the right thing. But it's going to take a while to manifest," Spain said. "What we do between now and then will be decisive. We must be prepared and adapt now to maximize the opportunity for increased resources in the future."

US Wargame in Pacific Tests New Air Mobility Comms Technology

Courtesy

Air Force pararescuemen from Kadena Air Base, Japan, and Joint Base Elmendorf-Richardson, Alaska, work with U..S. Marines to simulate a jungle rescue on Okinawa, Japan, during the large-scale Mobility Guardian 25 exercise.

By David Roza

ANDERSEN AIR FORCE BASE, GUAM

A massive U.S. military exercise in the Pacific is exploring how adding new communications equipment to cargo and refueling aircraft can help coordinate large troop movements across thousands of miles of open ocean.

"We like to say flexibility is the key to airpower, right? That flexibility, the agility to adjust to a changing environment … gives us a great ability to maneuver," Gen. John Lamontagne, the head of Air Mobility Command, told Air & Space Forces Magazine July 16 in an exclusive interview. "I think it all comes down to communication."

Military aircraft depend on systems that translate incompatible communications technologies to decipher data moving among them, satellites, and ground stations. But in a potential fight with China, those dependencies become weak points that can be jammed, intercepted, and disrupted. Mobility Guardian 2025, AMC's biennial combat training exercise, focused on fighting through such challenges.

Transports, tankers, and ground crews practiced rapid deployments as a force, rather than individually, deploying from home stations across the continental United States. About 85 mobility aircraft and 2,245 Airmen have participated in the exercise so far this year, moving more than 7,000 troops and 5,000 tons of supplies and equipment in seven days, an AMC spokesperson said.

Airman 1st Class Cameron Zorns, 6th Aircraft Maintenance Squadron crew chief, and Staff Sgt. Adam Fall, 6th AMXS flying crew chief, survey the boom of a KC-135 Stratotanker aircraft, while conducting preflight checks during the Air Force's Department-Level Exercise series at Andersen Air Force Base, Guam, July 2025.

Staff Sgt. Tryphena Mayhugh

PACIFIC-SCALE: 6,600 MILES, 10 TANKERS

About 400 U.S., German, and French paratroopers launched a simulated air assault July 13, departing Joint Base Elmendorf-Richardson, Alaska, aboard six C-17 transport jets, and pulling their rip cords in the dark sky over Charters Towers in northeastern Australia, 6,600 miles south of their departure. Along the way, those C-17s met up with an air bridge of 10 Air Force tankers—a mix of KC-46s and KC-135s—over the Pacific, four hours north of Guam, where they took on more than 470,000 pounds of fuel.

Timing that rendezvous was part of a 24-hour, nearly nonstop evolution. "For tankers, the challenge is ‘how do you link up with your receiver unit?’ And that’s a lot of what we do,” said Lt. Col. Kelsey Payton, who oversaw air refueling operations for the Department-Level Exercise (DLE) wargame, which involved more than 12,000 troops, hundreds of aircraft, and at least six international partners across the Pacific.

Though conceptualized months ahead, planners had only about a day to lay down the nuts and bolts of the refueling, such as radio frequencies, takeoff time, and flight plans. “We have a dedicated team of mission planners that come together and they say, ‘Hey, here’s the tasking, build the plan,’” she said.

Those things are relatively easy when operating in familiar territory with familiar teammates. Taking the show on the road makes establishing and maintaining tactical control harder, because it’s not immediately clear who to call to move cargo or get aircrew to and from their sleeping quarters.

“I spent most of my first few days here walking and driving to different agencies on base just putting faces to names, getting phone numbers, and knowing who to talk to,” Payton said.

Those relationships help when things inevitably go sideways, like when weather or airspace restrictions force changes in flight plans. Indeed, only about half the tankers that were originally supposed to support the DLE showed up, because the rest were diverted to support real-world operations, including Operation Midnight Hammer, the June attack on Iran’s nuclear facilities that took place shortly before the DLE kicked off.

Having fewer tankers available injects additional realism into the exercise; if the transport mission calls for 12 tankers, for example, but only 10 are available, then planners have to figure out how to make do with less.

“I’ll ask, ‘Hey can we come down on the ask?’ [and the answer comes back] ‘Oh yeah, we can come down 10,000 pounds on every jet.’ OK perfect, I can still meet your requirement,” she said.

Planning a 10-ship formation, a rarity in the tanker world, posed other challenges, especially since none of the 10 tankers had been in theater more than 24 hours before takeoff.

“What makes this unique is the amount of aircraft,” said Capt. Luke Hartings, who commanded one of six KC-135s. Hartings had flown in the night before, as did the tanker he was piloting. Maintainers worked all night to get the 60-something-year-old jet mission ready.

“They work miracles,” Payton said, who worked into the night to ensure Airmen working the mission had the food, water, and other needs on board to make the mission successful.

“We operate all around the world, and when you do that, you have to have a level of trust with your folks,” she explained. “They know the mission, they know the intent, they studied up, they got the briefing this morning, and now they’re ready to go out and do it.”

The crews didn’t disappoint. Payton would say later the mission went “extremely well,” thanks in part to a new piece of gear: the backpack-size Airlift Tanker Open Mission Systems [ATOMS] kit that acts as a mobile hot spot for secure and commercial Wi-Fi in flight. The ATOMS kits let the two formations talk with each other over long distances and switch up their plan midflight for a smooth rendezvous.

“The exercise demonstrated the benefit of having at least one connected aircraft in each formation,” Payton said. “For future exercises, we would want to schedule that requirement ahead of time, allowing planners to build contingency courses of action leveraging the ability to connect.”

But the lieutenant colonel and the rest of the tanker showrunners didn’t have time to celebrate, as they still had a long list of missions to plan.

“The pace is fast, and you’re like ‘dang it, we’re going nonstop,’” Payton said. “But I think it’s because that’s what our mission is: right people, right place, right time. At the end of the day, everyone needs Air Mobility Command.”

Space Force Reinvents Part Time: Not Your Dad's Guard & Reserve

By Greg Hadley

The Space Force revealed new details about its plan for part-time Guardians—and they aren't like anything the military has seen before.

Part-time service will be episodic, lasting for a tour or two, Space Force officials say, a complete shift from the classic one-weekend-a-month, two-weeks-a-year Guard and Reserve model that's existed for decades.

"Our long-term vision is not necessarily this career-long part-time work role," said Col. Matthew E. Holston. The Space Force anticipates having about 800 part-time positions.

The Space Force will begin taking over missions long performed by the Air Force Reserve and Air National Guard in October, and as part of that transition, it is accepting transfers from those components. To start, those transfers focused on Airmen willing to come into the Space Force in full-time roles—in late 2024, the service selected more than 250 members of the Air Force Reserve for full-time transfers, and on Aug. 18, officials began reviewing applications from Air National Guard members to become full-time Guardians.

Yet interest in the part-time roles remains high, and the transition is coming. On Sept. 3, the Space Force opened its application window for Air Force Reservists to apply for part-time USSF positions. The window is open until Oct. 10.

Those selected will incur a minimum three-year service commitment, which will also be the tour length for most part-time assignments "At the conclusion of the part-time assignment, members can compete for the same part-time assignment or another role, move to an inactive status, separate, or retire," a spokesperson told Air & Space Forces Magazine.

Commanders will regularly review part-time jobs to determine if mission requirements require a part- or full-time solution.

Part-time service is a way to retain Guardians whose family or other life circumstances might not enable them to continue on full-time Active duty. Then the member can return after a few years when circumstances change again.

"We are designing it to try to incentivize you to come back to full-time," said USSF Chief Human Capital Officer Katharine Kelley on a DefenseScoop podcast. "But what it does is allow people who might have a point in their life where say, you want to start a family or you've got an aging parent, and you need some flex, we can build that and have that."

Still, it does not appear that members will be barred from continuously reapplying for the same or similar part-time jobs. "Requests for a follow-on part-time assignment will be reviewed and matched based on current needs of the Space Force, informed by Guardian preferences," the spokesperson said. "For the vast majority of Guardians, assignments—whether full- or part-time—will be managed through the annual Guardian Assignment Timeline process, providing both the service and Guardian stability through the assignment process." Leaders have previously said they anticipate part-time Guardians will focus on test, evaluation, training, or planning jobs, while operational assignments will be reserved for full-timers.

Master Sgt. Jeffrey Schultze

The 216th Space Control Squadron, a geographically separated unit assigned to the California Air National Guard's 195th Wing, redesignated as the 216th Electromagnetic Warfare Squadron March 6, 2023.

Holston said part-time jobs will be demanding. "Your minimum participation can be 36 days, but the expected work schedule will be set by the hiring authority, and it may be Monday- through-Friday work," Holston said. "You may find opportunity for weekend work, but the hiring authority will define what the schedule looks like." The window for Air Guard members to apply to become full-time Guardians opened Aug. 18 and ran through Sept. 19. Transfers are expected to take place in spring 2026, and those selected must commit to at least two years of service. It's not yet clear when the window will open for Guardsmen looking for part-time jobs.

Only Guardsmen in space-focused ANG units identified by the 2025 National Defense Authorization Act are eligible for transfer to the Space Force:

■ **213th Space Warning Squadron**, Alaska Air National Guard

■ **148th Space Operations Squadron**, California Air National Guard

■ **216th Electromagnetic Warfare Squadron**, California Air National Guard

■ **137th Space Warning Squadron**, Colorado Air National Guard

■ **138th Electromagnetic Warfare Squadron**, Colorado Air National Guard

■ **114th Electromagnetic Warfare Squadron**, Florida Air National Guard

■ **150th Electromagnetic Warfare Squadron**, Hawaii Air National Guard

■ **109th Electromagnetic Warfare Squadron,** Hawaii Air National Guard

■ **126th Intelligence Squadron**, Ohio Air National Guard

On the Air Force Reserve side, those eligible include:

■ **Officers with:** 13S, 14N, or 17D career fields.

■ **Enlisted with:** 1C6, 1D7, 1N0, 1N, 1N2, 1N3, 1N4; or 1N8 career fields.

■ **Candidates** outside of space operations career fields who have space experience and are fully trained in the career field they are applying for.

ULA's Vulcan Centaur Makes Historic Launch

United Launch Alliance delivered into space the first experimental navigation satellite in half a century.

United Launch Alliance

By Greg Hadley

The Space Force celebrated two major milestones with a single mission in August: its first launch using the new Vulcan Centaur rocket and the first launch of an experimental navigation satellite in nearly 50 years.

USSF-106 launched Aug. 12 from Cape Canaveral Space Force Station, Fla. "Pretty historic point in our program history," said mission director Col. Jim Horne III in a briefing ahead of the launch. "We officially end our reliance on Russian-made main zsured access to space with at least two independent rocket service companies that we can leverage to get our capabilities on orbit."

Among the payloads: Navigation Technology Satellite 3, or NTS-3, which had been on hold as Vulcan awaited certification to carry National Security Space Launch missions. (Other payloads were not disclosed).

"I can't tell you how excited I am to see it finally launched and finally start the on-orbit experimental mission," said Joanna Hicks, a senior research aerospace engineer at the Air Force Research Laboratory.

VULCAN CENTAUR

After years of development, delays and certification processes, the Space Force and contractor United Launch Alliance are finally ready to send the new Vulcan Centaur rocket to orbit with government payloads onboard. The launch vehicle has flown twice before as part of the certification process, overcoming an anomaly with one of its solid rocket boosters on the second launch.

ULA officials are projecting confidence that they have resolved the second launch's issues and that the Aug. 12 flight was set up for success. For this mission, the rocket will have four boosters attached to help it reach geosynchronous orbit some 22,000 miles up, compared to two boosters on each of its previous two flights.

"The team over the last few months has been going through in excruciating detail, validating our analyses and predictions to support this flight, leveraging the data from the previous two missions to ensure mission success," said Gary Wentz, vice president for government and commercial missions at ULA.

The stakes are high for ULA because USSF-106 is the first of 25 ordered launches on Vulcan Centaur, and a backlog built up during the development and certification process.

"We're ready and postured to launch as quickly as we can as

JAMS: SECURE COMMS. ANYWHERE. ANYTIME.

MEET THE **JOINT AIRLIFT MICRO SCIF** — THE FLYAWAY SOLUTION FOR TODAY'S AGILE MISSIONS.

- ICD 705 Compliant
- ATTLA Certified
- TEMPEST Protection (100+dB RF Shielding)

HEI
Highland Engineering, Inc.

Learn More:
www.high-eng.com | 517-548-4372
sales@high-eng.com

we work through that backlog," Wentz said.

NTS-3

The NTS-3 spacecraft is "DOD's first experimental navigation satellite in 48 years," Hicks said. "The last one was NTS-2, launched in 1977, so at the lab, we think that we are overdue for an experiment in this area."

It's an expensive experiment—the Air Force Research Lab and the Pentagon have spent roughly $250 million developing and building the spacecraft and its associated ground systems, said Hicks, who has spent the better part of 10 years on the program.

From geosynchronous orbit, NTS-3 will conduct more than 100 position, navigation, and timing (PNT) experiments, including:

- A new electronically steerable phased array antenna, to beam high-powered PNT signals to specific areas of the globe where electronic warfare and jamming are particularly fierce;
- New advanced signals to guard against PNT spoofing, when adversaries try to imitate the signal;
- Reprogrammable equipment that can be updated on orbit to respond to new threats; and
- Receivers that can help navigate the satellite with less contact from ground operators.

NTS-3 is the first in a coming wave of experiments and prototypes meant to bolster the Space Force's Global Positioning System constellation and ensure capability persists when contested by adversaries. "PNT supports our nation's warfighters in every single domain and has become more critical to their success," said Andrew Builta, an executive at L3Harris, which built NTS-3. "That makes it a prime target for evermore audacious, frequent, and sophisticated jamming and spoofing attacks. We need technology as a nation to be responsive and flexible enough to ensure available, stable, and accurate PNT in GPS-disrupted, -denied or -degraded environments."

NTS-3 technologies and objectives dovetail with what the Space Force says it needs for future operations: agile software that can be reprogrammed on the fly, anti-jamming signals, more autonomous operations, and resiliency across orbits.

"One of the things that NTS-3 is testing is the multi-orbit constellation concept," Hicks said. "So can we receive signals from NTS-3 at GEO as well as GPS at [medium-Earth orbit], and take advantage of all of them? Maybe in the future, we'll be able to put some of these technologies in [low-Earth orbit], for example. We don't currently have that as a planned mission, but that's something that could conceivably happen in the future."

Space Systems Command, the Space Force's acquisition branch, is working on a Resilient GPS program of smaller, cheaper satellites to complement GPS. The Space Development Agency wants to embed PNT signals in its array of commercial satellites in low-Earth orbit.

AFRL is discussing the future of PNT with Space Force organizations like the Space Development Agency and the Space Warfighting Analysis Center, Hicks said.

USSF Wants to Share Intel with Industry

By Shaun Waterman

The Space Force's neighborhood watch-style initiative to share information with the private sector about threats to space assets will eventually grow to include classified intelligence, said Lt. Gen. Philip A. Garrant, who runs Space Systems Command (SSC), the Space Force's main acquisition organization.

"Ultimately, the idea is, let's do it at the classified level," Garrant said of SSC's Front Door, the Space Force's single point of contact for the space industry. Front Door's Orbital Watch program, launched in April, shares threat intelligence with space asset owners and operators.

Orbital Watch briefings so far are declassified threat intelligence products, offered on a quarterly basis. But at ASCEND, a space industry event, Garrant said companies with cleared executives or offices will eventually be able to receive classified briefings on specific threats they might face.

"If we have a relationship with a company that enables classified information sharing, we can do very specific threat sharing with a specific company about a risk that we're aware of for that company," Garrant told reporters at a media roundtable. That's the vision," he added. "It's going to take a little bit to get there."

In its current Phase One state, Garrant explained, Orbital Watch is disseminating unclassified threat information derived from U.S. intelligence agencies. That adds to private sector efforts like the Space Information Sharing and Analysis Center (ISAC).

After a Russian cyberattack against the Viasat network at the launch of the Russia-Ukraine war in 2022, the Space ISAC facilitated a classified briefing organized by then-Principal Deputy Director of National Intelligence Dr. Stacey Dixon. The agencies' briefing included the FBI and the National Air and Space Intelligence Center. A "significant number" of temporary clearances, known as "one-time read-ons," were issued to space company senior executives normally not cleared to receive classified intelligence, Space-ISAC said later that year.

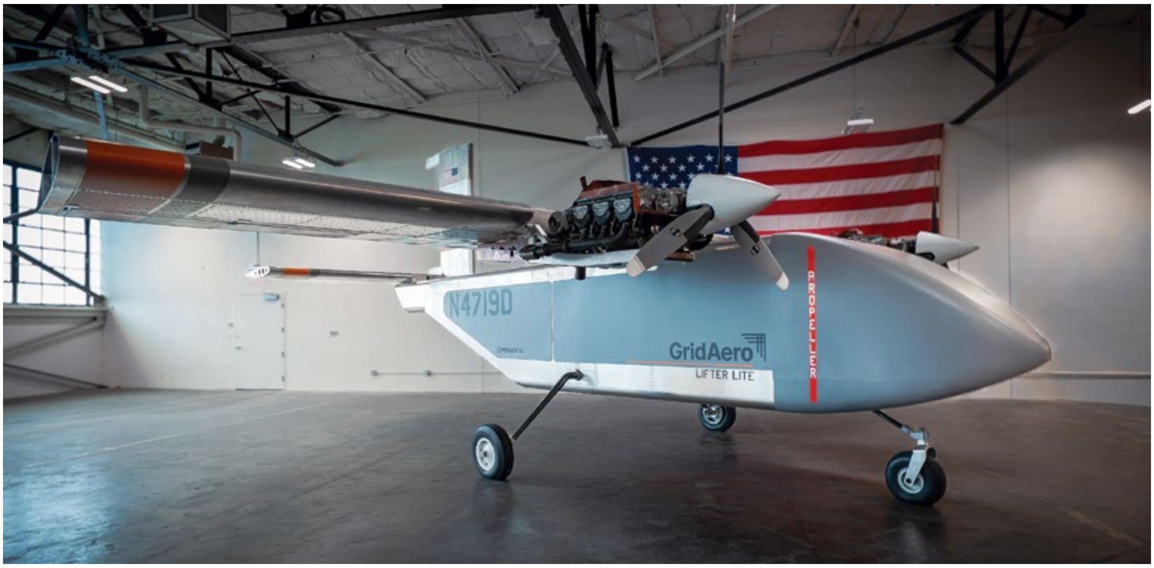
Jud McCrehin/staff

Lt. Gen. Philip Garrant, commander of Space Systems Command, is open to sharing classified risk analysis with private space operators.

Garrant said that in Phase Two, Orbital Watch will include a portal where vetted companies can share their own threat information to the U.S. government for anonymous dissemination across the sector—a model borrowed from the cybersecurity industry.

TECHNOLOG

Long-Range Drones Target Battlefield Delivery



The Air Force's AFWERX innovation arm is investing $6 million in Grid Aero's Lifter Lite, designed to carry up to 8,000 pounds of cargo up to 1,500 miles.

Courtesy of Grid Aero

By Greg Hadley

A new startup has a contract with the Air Force's innovation arm and a prototype to test its new concept: a network of "flying pickup truck" drones to solve the problem of logistics in the vast Pacific.

Grid Aero debuted its "Lifter Lite" drone Aug. 18, as the firm announced $6 million in seed funding and a small business innovation research Phase II contract with AFWERX.

Lifter Lite is meant to fly "thousands of pounds, thousands of miles," Grid Aero CEO Arthur Dubois told Air & Space Forces Magazine. The exact capacity and range could vary, but the idea is to be able to carry somewhere between 1,000 and 8,000 pounds over distances "like Guam to Japan," Dubois said—a trek of some 1,500 miles.

Dubois is no stranger to the autonomous cargo world; he previously worked as head of engineering for Xwing, which flew an unmanned modified Cessna aircraft in the Air Force's 2024 Agile Flag exercise, including moving equipment between two airfields some 400 miles apart.

The idea for Lifter Lite sprang from asking military and commercial air cargo stakeholders about their pain points, Dubois said. For the military, that's executing logistics in areas where U.S. assets could be attacked.

"We decided to then approach that problem with a clean-sheet design of a long-range, low-cost heavy lift autonomous aircraft that really is anchored around this idea of mass-deployed attritable assets in this kind of [agile combat employment-ACE] construct," he said.

Work began on a prototype in January, and final assembly finished in about six months. Ground testing is set to begin in the fall, "and then flight is when you're ready after that," Dubois said.

Compared to the C-130's 35,000-pound maximum capacity, the Lifter Lite is small. But Grid Aero is pitching it as the solution for a challenge Air Force leaders have been talking about for several years: how to handle the logistics of agile combat employment, or having Airmen and aircraft disperse from large central hubs to small, remote, or austere air bases to become harder to hit.

ACE is seen as especially vital in the Pacific, given the growing reach of China's missiles and the multitude of small islands that could serve as lily pads for military forces. Yet keeping such a distributed force supplied and capable of generating airpower is no small feat—especially in areas with contested airspace.

To meet that challenge, Grid Aero is pitching a vast network of drones.

"It's really this idea of distributing your cargo assets across many different aircraft, because when you're in a contested environment, if you lose one aircraft, the mission still has to carry on," Dubois said.

Coordinating and flying that many aircraft will require autonomous technology. Dubois said his firm is working on software to go along with its drone that will have a "human on the loop," capable of intervening if necessary.

"We're building a little bit of the higher-level autonomy functionalities around path planning, obstacle avoidance, threat detection and so on and so forth," he added, noting that Grid Aero's autonomy tech is meant to be compatible with larger networks that do battlespace integration, whether autonomous or controlled by a human.

Given how big the Pacific is and how little infrastructure many of its islands have, Dubois also said his firm is trying to build the Lifter Lite to be cheap and tough—"a flying pickup truck" with a "rugged, simple" cargo bay and landing gear engineered for rough runways.

"We've designed enough margin into the structure that it's not like if you have one little ding you're going to have to stop and fix it," Dubois said. "It's also true for the components where we have enough redundancies that we can take off with parts of the system not operating or destroyed."

Grid Aero is also suggesting its flying truck could be used for intelligence, surveillance, and reconnaissance, air-to-air refueling, or as a mothership for other drones.

"Our customers will put what they want on it, and it can be used for many, many different things," he said.

Grid Aero isn't the only business eyeing smaller aircraft for such missions. Joby Aviation—which acquired Xwing in June 2024—has announced a partnership with L3Harris to develop an autonomous vertical takeoff-and-landing aircraft for defense missions like contested logistics, officials have said. And Reliable Robotics, another autonomy startup, has outfitted Cessnas of its own to carry cargo, too.

Grid Aero's advisory board includes a trio of retired Air Force officers—Lt. Gen. Leonard Kosinski, former director of logistics for the Joint Chiefs of Staff; Maj. Gen. Lawrence M. Martin Jr., a former mobility wing commander and assistant deputy undersecretary of the Air Force for international affairs; and Col. Steve Marshall, former chief of international affairs at Pacific Air Forces.

PERSONNEL

Were Vets Exposed to Toxins on Nevada Test and Training Range?

The Nevada Test and Training Range is a vast swath of desert. The range was once used for nuclear tests, and other testing has left toxins throughout. Air Force 1st Lt. Matthew Clark took part in an operational test here in early April.

Staff Sgt. Jose Miguel Tamondong

By Rachel S. Cohen

In 1983, Dave Crete graduated from technical school bound for one of the Air Force's most unusual postings for security forces Airmen: the Nevada Test and Training Range.

Protecting the NTTR, home to some of America's most secretive weapons testing and Red Flag, the Air Force's premier combat training exercise, was a dream.

Four decades later, Crete says the assignment exposed him and others to radiation and toxins that cause cancer and other medical ailments. He's pressed Congress to make it easier for vets like him to gain disability compensation and VA treatment for illnesses he believes were caused by their time at NTTR.

"You believed that the government wasn't going to send you somewhere that simply being there was going to be harmful," he told Air & Space Forces Magazine. "There was absolutely no understanding."

The Nevada Test and Training Range—a remote swath of land the size of Delaware and Rhode Island combined, considered part of the Nellis Air Force Base complex outside Las Vegas—conducted hundreds of nuclear weapons tests at its Nevada Test Site and Tonopah Test Range over four decades, irradiating the surrounding environment. Airmen have rotated through jobs on the range for decades.

Legislation in the Senate's version of the 2026 National Defense Authorization Act would require the Pentagon to classify the range as a contaminated site and identify people who have worked there. That would make it easier for those vets to seek disability benefits and free health care through the Department of Veterans Affairs to cover illnesses that could be tied to radiation exposure at NTTR.

The provision, if it makes it into the final bill, would direct the Air Force to identify all troops stationed at the range since Jan. 27, 1951, when the U.S. government conducted its first atmospheric nuclear test there almost 75 years ago.

Crete, who now runs The Invisible Enemy, a nonprofit advocating for NTTR veterans, estimates thousands of security forces, aircraft maintainers, and other Airmen suffered exposure during that time.

Courtesy of The Invisible Enemy

Dave Crete, founder of The Invisible Enemy.

Some veterans have encountered difficulty trying to convince VA of service-connected illnesses they link to NTTR, Crete said, because so much of the work there is classified, limiting what they can share about the assignment. Portions of the range have already been designated as contaminated. The Department of Energy grants compensation to affected civilian staff, but has withheld that help from military veterans, who must go through the VA system.

"Veterans have been exposed to radiation and toxic chemicals as a result of their selfless service to our nation, and the least we can do is ensure they get the treatment they need," said Sen. Jacky Rosen (D-Nev.) in a July release.

Rosen and Sen. Catherine Cortez Masto (D-Nev.) introduced a bill in July to grant DOD employees the presumption of exposure if they served at DOE facilities that, like the Tonopah Test Range, have already been deemed toxic. Their bill, dubbed the FORGOTTEN Veterans Act, would have added lipomas (noncancerous growths of fatty tissue) and other tumor-related conditions to the list of medical issues the VA automatically links to service-related toxic exposure. Veterans who have served on or above the range would be presumed exposed, meaning they wouldn't have to prove that their military service put them in harm's way.

Scaled-down language in the draft defense policy bill, if enacted, would not go quite so far, but would still be a step toward broader protections for NTTR veterans and their families.

SECRET MISSIONS

Like many brand-new Airmen, Crete hoped to snag an overseas job when he got his first Air Force assignment. Instead, he was assigned to NTTR.

"You would fly up there on your Monday, and you'd fly home on your Friday … in a civilian chartered airliner out of Nellis," he said. "The first day up, they sit you down in the cockpit of a stealth fighter that … basically nobody's ever seen."

And then there were the Russian MiG fighters on the flight line.

"We're all looking out the window. … 'Where the hell did we end up?'" he said.

Crete spent almost four years with the 4461st Security Police Squadron, guarding the then-deeply secret F-117 program, America's first stealth jet. He patrolled the grounds on foot, just miles from areas deemed too contaminated for humans to enter.

"You never thought about it," Crete said. "We didn't wear dosimetry. … We wore military-grade fatigues."

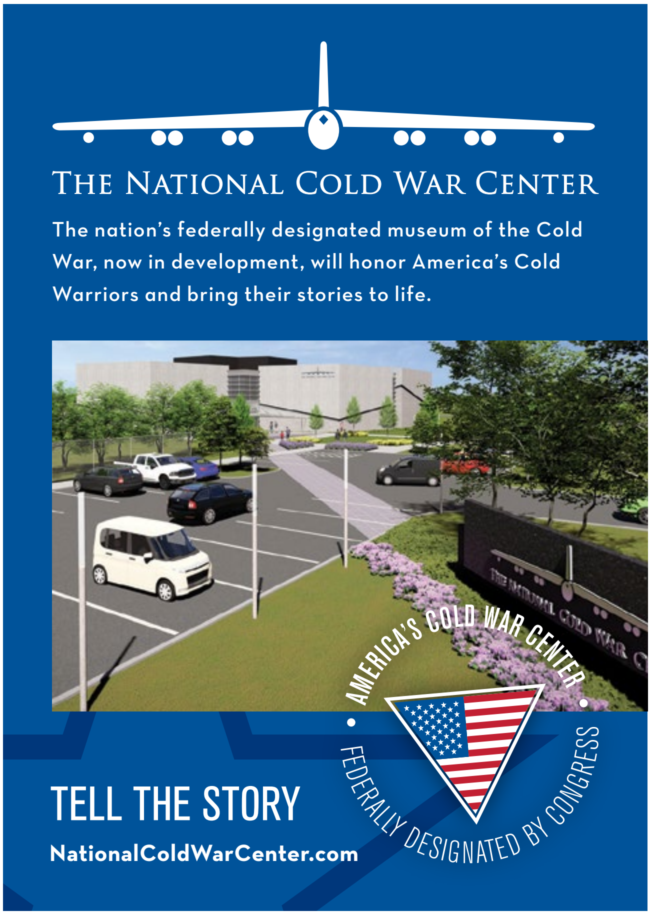
Because Tonopah is so remote, the federal government used it for field tests of "greater hazard" than it would run at Department of Energy facilities in New Mexico and California, according to a 1975 report from the U.S. Energy Research and Development Administration, two years before it was folded into DOE. Those there were exposed to tests using plutonium, depleted uranium, and beryllium, a nonradioactive element linked to lung disease. The report noted that the government disposed of some explosive waste in open burn pits.

A 1993 radiological survey of the Tonopah Test Range conducted by the Energy Department found that "substantial [americium-241, a byproduct of plutonium] contamination was found around the Clean Slates sites … extending several miles southeast of the fence boundaries."

The Clean Slate tests were part of the "Roller Coaster" series of four joint U.S.-British nuclear experiments in 1963 that studied plutonium fallout. Detonations took place just east of the Tonopah runway, where Airmen, federal civilians, and contractors worked, government maps show.

Americium-241 can stay in the human body for decades, causing cancer in bones, muscles, and the liver, according to the U.S. Centers for Disease Control and Prevention.

The 1975 report argued there was no indication that plutonium from the "Roller Coaster" tests had spread past


THE NATIONAL COLD WAR CENTER

The nation's federally designated museum of the Cold War, now in development, will honor America's Cold Warriors and bring their stories to life.

AMERICA'S COLD WAR CENTER • FEDERALLY DESIGNATED BY CONGRESS •

TELL THE STORY

NationalColdWarCenter.com

the fence line or “entered significantly into local biological systems or food chains.”

“Discontinuing the work done at the Range would be against the national interest,” the report said. “As long as the nation chooses to maintain an up-to-date nuclear weapon stockpile, some facility such as the Tonopah Test Range must continue to exist. … The environmental costs inherent in the work are small and reasonable for the benefits received.”

In 2014, 31 years after first reporting to the NTTR, Crete reconnected with friends and discovered that many in the group had lung problems, tumors, children with birth defects, and more. Crete, who has suffered from lipomas and chronic bronchitis among other ailments, contends radiation and toxins on the range have sickened NTTR vets at a higher rate than the general public.

“We started finding out about more people that have died and people that are seriously screwed up from working out there,” he said.

Crete estimates he’s spoken to about 1,000 people with similar concerns about their time at NTTR. The VA doesn’t track data on illnesses by location, so there is no way to determine how many NTTR vets have made claims, said VA spokesperson Gary Kunich in an email response to questions.

Crete believes Airmen at NTTR may still be at risk. Col. Shaun Loomis, who took over as the range’s commander in June, declined to answer questions from Air & Space Forces Magazine on the topic.

While veterans don’t need a presumption of toxic exposure to get VA benefits, the designation allows them to enroll in VA health care without needing to apply for disability benefits first. Other claims are handled on a case-by-case basis to determine if they’re connected to military service—a process requiring a paper trail that may stretch back decades. For service-connected ailments, VA benefits can include tax-free disability payments, free or subsidized health care at VA facilities, and survivor benefits.

The push to cover NTTR vets echoes the efforts of other Air Force veterans' groups, including of fighter pilots and missileers, that seek coverage for certain ailments they see as service-connected.

Crete sees their fight as collective, where progress for any can be a win for all.

“There’s still people working out there,” Crete said. “Their future is my reality today.”

USAF Forced to Pause Some PCS Moves

Airmen without authenticated orders and scheduled to move to a new duty station between Oct. 1 and Dec. 31 are now on hold until Jan. 31 or later, the Air Force said.

Rodney Speed/USAF

By David Roza

The Air Force put some permanent change of station (PCS) moves within the continental United States on hold due to a shortfall in its personnel budget.

Airmen without authenticated orders in hand who were scheduled to move to a new duty station between Oct. 1 and Dec. 31 are now on hold until Jan. 31 or later, according to a memo written by the Air Force Personnel Center and shared on the popular Facebook page Air Force amn/nco/snco on Aug. 14. An Air Force spokesperson confirmed the memo was authentic.

The spokesperson could not immediately provide an estimate for how many Airmen might be affected by the changes. The group on hold includes Airmen with a controlled tour, such as an instructor position, that is scheduled to begin or expire in November or December. The assignments beginning or ending in November are pushed to Jan. 31, while those beginning or ending in December are extended to Feb. 28.

The PCS pause does not affect Airmen moving to or from locations outside the continental United States, Space Force

Guardians, or members of the Air National Guard or Air Force Reserve, the memo said. Airmen with their authenticated orders in hand are also safe, no matter what their projected departure date, as are Airmen with a projected departure date of Sept. 30 or earlier.

Another group of Airmen unaffected by the delay are those with an assignment that meets special criteria, such as professional military education and other forms of training.

“Impacted Airmen are permitted to request an exception to policy and should work closely with their leadership to submit a request,” the spokesperson said. “Those impacted should contact their local Military Personnel Flight with questions.”

The spokesperson did not explain what caused the funding shortfall, but the funding should be replenished with the start of fiscal 2026 on Oct. 1. PCS funding is provided when orders are authenticated, so by delaying orders, the Air Force keeps the military personnel budget in the black and avoids violating federal law.

While the next fiscal year starts in October, the move dates for Airmen caught up in the delay won’t be until Jan. 31 or later, so they have time to plan their moves.

“The gap between order authentication and the report date provides Airmen sufficient time to arrange the movement of their household goods to their new duty location,” the spokesperson said.

Still, the changes are not ideal for Airmen trying to buy or sell a house, or line up dates for their children to start at a new school, as some comments pointed out on the unofficial Air Force subreddit.

The hold comes about three months after the Air Force put a similar pause on retirement and separation orders, also due to a depleted personnel budget. The service delayed issuance of separation orders for troops with a separation date of Jan. 1, 2026, or later. It also delayed issuance of retirement orders for troops with a retirement date of April 1, 2026, or later.

“It’s not because the Chief of Staff of the Air Force said, ‘We want to wait to give people orders,’” RAND senior operations researcher and Air Force veteran Lisa Harrington said in May. “It’s because the Air Force must comply and not overspend that budget by law.”

In 2023, the Air Force had to pause bonus programs, PCS moves, and some other incentive pays for nearly three weeks when the service ran out of personnel funds. Higher-than-expected PCS costs—a result of inflation—and higher retention and recruiting bonuses all contributed to the shortfall, officials said at the time.

While external factors may make it impossible to eliminate personnel budget shortfalls entirely, experts at RAND say budget stakeholders can reduce the risk by better integrating their decision-making and producing better data on the impact of bonuses and other compensation tools.

The pause is happening as the Pentagon conducts a wider rethink of the entire PCS process. In May, acting Undersecretary of Defense for Personnel and Readiness Jay Hurst gave the military services four months to develop plans to reduce their budgets for “discretionary” PCS moves by 50 percent by fiscal 2030 compared to the fiscal 2026 budget.

The Pentagon spends about $5 billion total moving service members and their families every year, and many of them don’t like it. A survey of Active-duty spouses released in May found record rates of spouses (32 percent) want to leave the military, with a large number of them frustrated by the difficulty of finding employment, child care, and reimbursement for moving costs after a move.

Military Air Crew Headsets

Passive or Active Noise Reduction. We’ve Got You Covered.

Model H10-76

Standard Noise Attenuating
NSN #5965-01-390-9240

Model DC ONE-XM

HYBRID ENC

Active Noise Reduction (ANR)
NSN #5965-01-684-5485

David Clark Company military aviation headsets have set the standards for outstanding comfort, rugged reliability and performance for decades. So whether you choose the standard noise-attenuating model H10-76 or the model DC ONE-XM with Hybrid Electronic Noise-Cancelling ANR technology – mission accomplished.

For more information, visit **www.davidclark.com** or call **1-800-298-6235**.

David Clark
WWW.DAVIDCLARK.COM

An Employee Owned American Company

© 2025 David Clark Company Incorporated
® Green headset domes are a David Clark registered trademark.

HISTORY

A Last Hurrah for the Storied U-2

By John A. Tirpak

Senior Airman Frederick Brown

This U-2 flew a 14-hour mission, the longest ever by a TU-2S, covering 6,000 miles and overflying all 48 of the contiguous U.S. states.

A year away from its likely retirement—and 70 years to the day after the first U-2 flight—a two-seat version of the Dragon Lady from the 9th Reconnaissance Wing at Beale Air Force, Calif., set records for distance covered and endurance on a single mission, demonstrating the venerable type's continuing capability.

The July 31 mission flown by a TU-2S covered some 6,000 miles across more than 14 hours—the longest flight ever made by the type—during which it overflew all 48 of the contiguous U.S. states. The flight was accomplished by two senior U-2 pilots, who hold the record for highest number of hours in the jet, per a release from the wing. They took off and landed from Beale Air Force Base, Calif., the U-2's home since 1976, and flew in the vicinity of 70,000 feet.

U-2 flights in the past have lasted as long as 11 hours, then considered the maximum endurable by the pilot. Due to the extreme altitudes at which the aircraft flies, U-2 pilots must fly fully contained in a pressure suit; they have very limited ability to move, and can take in food and water only through a tube.

Given those limitations, this record-breaking flight "maxed out the operational range of the U-2 and placed the pilots at the edge of their physiological limit," the wing release stated.

Lt. Col. John Mattson, 1st Reconnaissance Squadron (RS) commander, said the unit "continues to hone our combat competencies showcasing Beale's capacity as a power-projection platform to rapidly respond to adversary actions anywhere in the world."

The Air Force plans to retire the U-2 in fiscal 2026, which begins in October; the service has cited a desire to transition to space-based and unmanned systems, the increasing reach of adversary air defenses, and operating costs. Air Force officials have also cited diminishing manufacturing sources, affecting parts availability.

The single-seat U-2's mission capability rate declined from 76 percent to 61.9 percent from fiscal 2023 to 2024; the two-seat TU-2S's availability declined from 81 percent to 59.2 percent across the same period.

One of the pilots on the mission, Corey Bartholomew, is the 1st RS flight safety officer and U-2 instructor who also flew NASA's version of the U-2, the ER-2. He said he has been thinking about a flight that would push the U-2 to its limits for 11 years.

"Now that we're on the 70th anniversary of the U-2—70 years at 70,000 feet—it seemed right to demonstrate the true capability of this aircraft," he said. The Air Force only identified the other pilot, a lieutenant colonel, by his call sign, "Jethro."

The flight also proved out new mission planning software used by the U-2 squadron. "The software has not been used for a flight this long before, or with so many factors to account for," the Air Force release said.

The service said the mission showcased the U-2's capabilities and honored all those who flew or worked on the jet over its 70-year history.

"The Dragon Lady is one of the most difficult planes to fly due to its unique design, requiring a chase car to assist in landing," the Air Force said. The jet's long nose makes it difficult for the pilot, inside a cramped cockpit with very limited movement, to see how far off the runway the aircraft is. Another U-2 pilot in a fast chase car drives alongside the jet on landing to provide the flying pilot with situational awareness. A little more than 1,000 pilots have qualified to fly the U-2.

The flight path on the record flight took it over the homes of "U-2 pilots who made the ultimate sacrifice" to honor them, the service added.

Plans to retire the U-2—in favor of the RQ-4 Global Hawk and other capabilities—have been rebuffed by Congress several times, mainly because the U-2 alone could carry the Optical Bar Camera, an extreme-resolution wet-film camera. But digital methods eventually matched it and the system was retired in 2022. The U-2 also can shift missions more flexibly than the uncrewed RQ-4, which must be reprogrammed to change its objectives.

The RQ-4 is also slated for retirement in 2027. The Air Force has not publicly announced an airborne intelligence, surveillance, and reconnaissance platform that will succeed the two jets, although it is reported that a classified system, known as the RQ-180, has been operating for some time. Beale is slated to be the initial operating base for the Air Force's new Collaborative Combat Aircraft.

The U-2 was devised by Lockheed's "Skunk Works" advanced development unit in the early 1950s. The Central Intelligence Agency wanted an aircraft that could overfly the Soviet Union, above the reach of that country's antiaircraft systems, and capture photographs of Russia's military capabilities, especially its rocket technology. The first U-2 took off in utter secrecy on July 31, 1955. U-2s flew over Russia from 1956 to 1960, when one was famously shot down, leading to a show trial of its pilot, Francis Gary Powers. Powers was convicted of espionage but was traded for a Russian agent in U.S. custody a few years later.

The U-2 fleet underwent a major upgrade in the 1980s, when Lockheed "remanufactured" the jets, enlarging them by 40 percent and equipping them with modular reconnaissance pallets that could adapt to the ISR mission required—payloads up to three times heavier than the original aircraft could carry. This was also enabled by equipping them with new GE F118 engines. The type underwent further significant but largely classified upgrades in the 1990s and 2010s; those upgrades added more sophisticated sensors, generating data that could be more rapidly and easily processed.

Bombardier
Defense

DELIVERING DECISIVE CAPABILITIES
AT THE TACTICAL EDGE

EAGL
Expeditionary Aerial Global Logistics
Bombardier Challenger 3500

DEFENSE.BOMBARDIER.COM
© 2025 Bombardier Inc.

USAF

AC-119 gunships packed deadly fire, but operating both low and slow, were best suited to night operations. In May 1972, that wasn't an option for thew crew of Stinger 41.

'Prepare to Abandon the Aircraft!'

Inside a Vietnam War aircrew's shootdown and the fight to honor their courage.

By Matthew Cox

The 10 Airmen of Stinger 41 knew the risks of flying their AC-119K gunship in daylight over enemy anti-aircraft gunners —a rare mission for an aircraft designed for night operations in the Vietnam War.

It was May 1972, an intense period in the war, and they had their orders. Besieged South Vietnamese forces near Saigon needed help. Once over their objective, explosions from North Vietnamese Army (NVA) anti-aircraft fire rocked the slow-moving gunship as the crew struggled to locate their target. After several unsuccessful passes, enemy 37 mm fire tore into the plane's two right engines, engulfing them in flames.

Stinger 41 was going down. Seven crew members managed to don parachutes, bail out, and survive in the enemy-infested jungle until being rescued several hours later. The pilot and two other crew members perished in the crash.

In the aftermath, Capt. Terry Courtney, the pilot, was honored posthumously with the Air Force Cross, the Air Force's second-highest award for valor, following only the Medal of Honor. Award packages prepared for the remaining nine crew members were never reviewed; they were lost when the 18th Special Operations Squadron (SOS) was deactivated in December of that year.

Now, a half century later, the AC-119 Gunship Association is fighting to right that wrong and ensure that the crew of Stinger 41 is recognized for the courage displayed on that mission and to overcome two rulings amid the chaos of the May 1972 mission. To win, they will have to overcome not one but two rulings by the Secretary of the Air Force Decorations Board, in 2022 and 2024, that downgraded awards for two crew members killed in the crash and denied decorations for the seven survivors.

> ***"The courage and sacrifice of these Airmen demands recognition befitting their gallantry."***
> —Former Secretary of the Air Force Whit Peters

STINGER 41 CREW:

- **Staff Sgt. Ken Brown,** illuminator operator and jumpmaster, (KIA)
- **Capt. Terry Courtney,** pilot and aircraft commander, (KIA)

- **Capt. Rod Slagle,** Navigator, (KIA)
- **1st. Lt. Larry Barbee,** navigator and night operations scope operator
- **Staff Sgt. Allen "Yogi" Bare,** flight engineer, (Deceased 2000)
- **1st. Lt. Jimmy Barkalow,** copilot, (Deceased 2021)
- **Airman 1st Class Richard Corbett,** aerial gunner
- **Staff. Sgt. Dale Iman,** aerial gunner
- **Staff Sgt. Francis Sledzinski,** lead aerial gunner
- **Lt. Col. Byron Taschioglou,** forward looking infrared operator, (Deceased 2002).

Former Air Force officials leading the awards request effort—backed by a former Air Force Secretary and 24 retired generals—have written to Colby Jenkins, assistant secretary of defense for special operations forces and low intensity Conflict and to President Donald Trump for support. They argue that the board "failed in process and fairness" when considering the dangers crew members faced while flying in daylight through concentrated NVA anti-aircraft fire to support embattled South Vietnamese forces.

In a letter to Jenkins, former Secretary of the Air Force F. Whitten Peters requested an "independent and impartial review" of the Stinger 41 case. Peters, a Navy veteran, is a former Board Chairman of the Air & Space Forces Association, which publishes Air & Space Forces Magazine.

"The courage and sacrifice of these Airmen demands recognition befitting their gallantry," the June 17 letter states.

AIRCREWS UNDER FIRE LATE IN THE WAR

In March 1972, the North Vietnamese Army launched its Easter Offensive, sending more than 100,000 troops equipped with Soviet-built tanks, artillery and anti-aircraft systems, into South Vietnam. They quickly began overwhelming South Vietnamese defenses.

The U.S. Army had already begun its "Vietnamization" program, withdrawing ground combat troops from Southeast Asia and turning the fighting back to the South Vietnamese Army. But American airpower was still actively engaged in combat. AC-119 crews, equipped with infrared targeting sensors, four 7.62 mm miniguns and two 20 mm cannons, routinely braved anti-aircraft fire flying night missions against enemy tanks and ground vehicles.

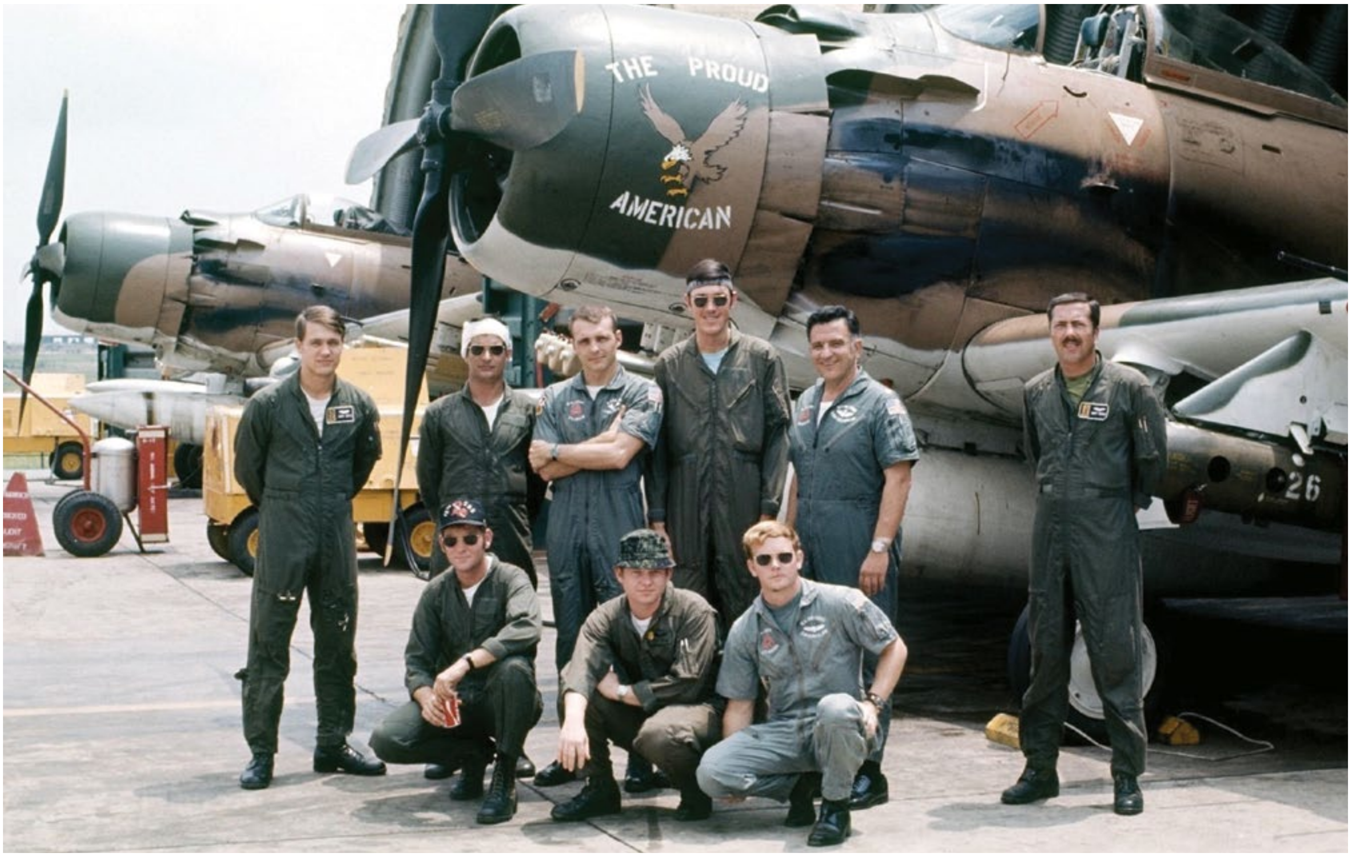
The Korean War-era AC-119 didn't fly on daylight missions because it was slow, and its all-black exterior made it an easy target. But on May 2, 1972, the crew of Stinger 41 took on an urgent daylight mission: A pallet of ammunition had been misdropped during an aerial resupply mission in An Loc, 65 miles north of Saigon, and with the NVA having encircled the city, it had to be destroyed before the enemy could seize it.

Carrying as much ammunition as possible, Stinger 41 took off from Bien Hoa Air Base at noon and was over the target area by 2 p.m. Below, thousands of NVA soldiers were launching repeated attacks on An Loc.

Flying at 3,500 feet, crew members realized it would be difficult to spot the orange-marked ammunition pallet in the triple-canopy jungle that surrounded the city, and began orbiting the target area in search of their quarry.

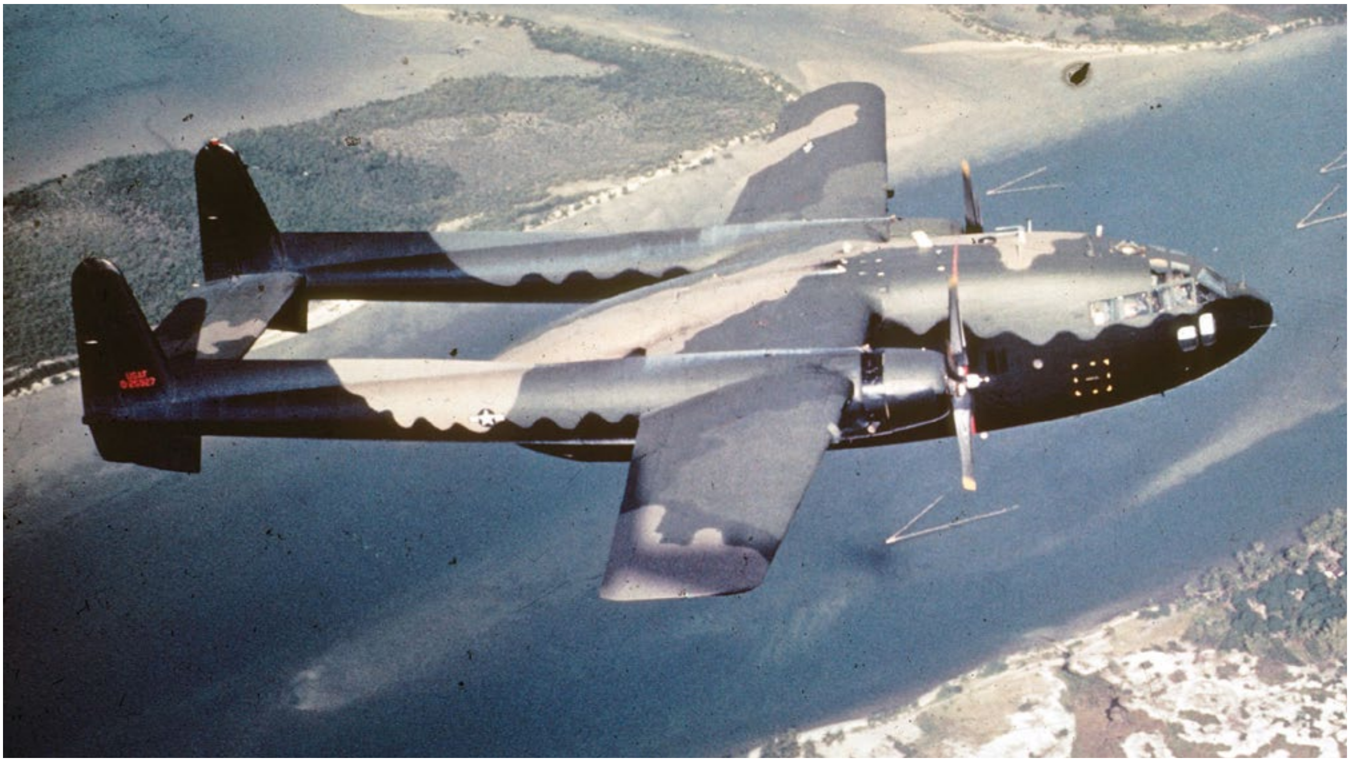
That's when three enemy 37 mm anti-aircraft artillery (AAA) positions opened fire. Airbursting munitions exploded into black clouds of shrapnel around the plane.

"Whenever the shells burst around the plane ... you see this



AC-119 Gunship Association

Surviving members of the Stinger 41 crew pose in front of one of the A-1 Skyraiders that assisted in their rescue. Top row—Staff Sgt. Allen Bare, 1st Lt. Larry Barbee, Staff Sgt. Francis Sledzinski, Lt. Col. Byron Taschioglou. Bottom row—Airman 1st Class Richard Corbett, Staff Sgt. Dale Iman, 1st Lt. Jimmy Barkalow. Far left— 1st Lt. Larmar Smith, A-1 Skyraider pilot who flew air support on the rescue mission. Far right—Denny Morgan, A-1 Skyraider pilot who flew air support on the rescue mission.



USAF

Most gunships, like this AC-119G, were painted black on the bottom. It made them less visible from the ground at night.

flash and then those black particles going out," recalled 1st. Lt. Larry Barbee, navigator and night operations scope operator, years later in a video interview. "You could hear whenever they were hitting the fuselage."

The aircraft climbed to 4,500 feet as the crew continued their search. Crew members leaned out of the aircraft, two at a time, trying to spot the source of enemy fire. But the well-camouflaged enemy gunners knew to wait until the aircraft had passed them before firing, and tracer fire disappeared in the sunshine.

Then Capt. Tom Milligan, flying an O-2A Skymaster alongside Stinger 41, recalled the radio traffic. Stinger 41's pilot said he planned to make one more pass in search of the target, then break off, wait and return again.

"All of a sudden, I saw his right wing just explode in fire," Milligan, who retired as a lieutenant colonel, told Air & Space Forces Magazine in summer 2025, the memory as vivid now as ever. "His wing just was in flames from the piston engine out past the jet [engine] and all the way to the wing tip, and flames were leaping back 20 or 30 feet behind the wings down the side of the fuselage."

Inside the aircraft, Airman 1st Class Richard Corbett heard a loud "foom, foom!" As the wing ignited, he witnessed the "reflection of the flames on the inside of the aircraft."

Both right engines lost power and crew members began their emergency procedures.

"There was all kinds of sheet metal hanging and blowing in the wind," Barbee said. "I thought to myself, 'we are going to be all right. We are just going to shut down the engines and fly back.'"

It wasn't so simple. The pilot's voice boomed over the intercom—"prepare to abandon the aircraft!"

BAILING OUT

The crew strapped on parachutes, helping each other, and Staff Sgt. Francis Sledzinski opened the jump door and jettisoned the flare launcher to clear the way.

"I heard Capt. Courtney say 'abandon the aircraft' twice. I unplugged my mic, and I was out the door," he recalled in his video account.

Sledzinski recalled pulling the ripcord, opening his parachute.

"I'm looking around trying to figure out what was going on, and I heard this phit, phit, phit sound," he said. "I realized that the bad guys on the ground were shooting at me."

Sledzinski descended through the trees, but his parachute snagged on a tree and he hung there, just 2 feet from the ground. He unhooked his parachute and started moving.

"The jungle was so thick that I had to get on my hands and knees and crawl until I came to an area that had a small opening with a dead tree in it," Sledzinski said. "I sat down there, drank one of my canteens dry, and turned on the radio."

Corbett recalled approaching the jump door surprised that "this is really happening." He told himself, "don't stop at the door and don't look down," he recalled in a video. "The next thing I knew, I had opened my eyes and I'm looking up and I pulled my ripcord."

He saw Sledzinski being shot at on the way down, but powerless to do anything, he focused on his own survival, steering his parachute toward a small clearing.

Barbee's parachute descended into trees. "I put the visor on my helmet down, I put my legs together, I turned my head to the side so I wouldn't get stabbed by the tree limbs and I shut my eyes," Barbee said, tree limbs breaking off as he thumped and banged through the canopy.

"I thought, I'm going to get stuck in a tree and they are going to come along and shoot me," he recalled, but when he opened his eyes, he was only a foot from the ground. In what "seemed like a half a second later I was already across that clearing … and deciding which way to go."

Lt. Col. Byron Taschioglou, Staff Sgt. Allen Bare, and Staff Sgt. Dale Iman also bailed out and landed safely. First Lt. Jim Barkalow, the aircraft's copilot, was the last to bail out of the plane. Only about 300 feet in the air, it was far below the minimum safe altitude for a parachute to open safely.

"Terry Courtney and I were flying the airplane as best we could with the drag and the lack of power," recalled Barkalow, who survived the fall and later retired as a lieutenant colonel. "I ran to the back and jumped out," he says in a video. "I pulled [the ripcord] the second I exited the airplane, and I hit the trees."

Barkalow's parachute collapsed and he plummeted 40 feet through trees, lacerating his head.

Seconds later, retired Lt. Gen. Thomas Waskow, who was then a first lieutenant, serving as a second forward air controller that day, witnessed the aircraft "pitch up and roll inverted and hit the ground almost straight nose down."

Courtney, Brown and Slagle were killed before they could escape.

SURVIVING ALONE IN THE JUNGLE

As soon as the crew of Stinger 41 started bailing out, Milligan and Waskow began coordinating one of the largest search and rescue operations of the war. They radioed to launch a search and rescue force, which included two HH-3E Jolly Green Giant rescue helicopters escorted by two A-1 Skyraider combat aircraft.

This was a highly complex rescue. Milligan said he typically would have to keep track of one or two downed pilots, but this time he was trying to track seven crew members. He noticed a stream running through the jungle and traced it on his windshield with a grease pencil.

"Then as each survivor came off and came down, I [marked] where they landed in reference to this little stream," Milligan said.

The survivors on the ground tried to manage their fear and fall back on their survival training.

"I found a hiding place and I remember shaking like this," Corbett said, shaking his hands frenetically. He remembered struggling to put camouflage paint on his face.

"Mosquitoes were buzzing around. I was sweating. I said, 'You need to calm yourself down.'"

Taschioglou landed in a grove of bamboo trees. Escape and evasion training taught him to move away from his landing site for 15 minutes.

"I just ran and I didn't care whether it was 15 minutes or not; I just stopped when I was tired," Taschioglou said in an audio letter to his family on May 7, 1972.

"I picked a fairly good hiding place—the best thing I could find at the time—because I was too tired to move any further," said Taschioglou, who then called Milligan on the radio. He put his radio down briefly and then heard Milligan answer, "I read you loud and clear … assume cover, help is coming, and don't worry, buddy.'"

The next thing Taschioglou heard was machine gun fire only about 20 meters from his position.

"I just got up, and I started going like crazy on my hands and knees through the jungle in the opposite direction of that machine gun," he said. "I really don't know how long I crawled."

He found a new hiding place under a dead tree limb. He crawled in backward, so he was facing out, Taschioglou said. "I camouflaged myself, darkened my face, then I pulled out

Capt. Terry Courtney sitting alone in the cockpit of a AC-119K gunship. With his plane's wing on fire, Courtney twice ordered the crew to abandon the aircraft, ensuring most survived. He did not.

AC-119 Gunship Association

my gun and just sat there and waited."

Gunfire erupted all around him as NVA forces began shooting at the forward air controllers and arriving helicopters. Skyraider aircraft strafed enemy positions with machine guns and fired rockets, Corbett said.

Barbee fought to maintain his self control. "To actually gain control in that situation and maintain it was very difficult," he said.

One by one, Milligan talked to each crew member on the radio, saying, "I know where you are. Stay hidden. Stay cool."

Sledzinski, connecting with Milligan by radio, recalled their brief conversation.

"He asked me where I was, and I told him I was in the jungle, and he started laughing," Sledzinski said. He heard Milligan's airplane and told him so. "He turned around, came back, put [his aircraft] on the side, looked over at me and smiled and waved."

RESCUE

Sledzinski was the first to be rescued, but not without a fight. Waskow had coordinated with two Army UH-1 Huey helicopters in the area. One got within about 20 feet of his position, but "ground fire opens up all around us and starts hitting the chopper, and the chopper pulls off smoking," Sledzinski said.

Two Skyraiders flew in on either side of Sledzinski, firing machine guns into the jungle. An Army medevac Huey followed close behind. Sledzinski popped a flare to mark his location.

"This medevac chopper comes, they slide the door back … and the three of them opened up with M-60 machine guns around me," he said.

Another Soldier threw a rope down, Sledzinski tied it to his equipment and he dangled at the end of it while the Huey flew him to a nearby South Vietnamese firebase.

It was early evening when Jolly Green Giant helicopters were able to lower their jungle penetrator devices to pick up the other downed crew members. The first time Taschioglou reached for the penetrator, he "just about had my arms around it when they lifted it right up and they left," he said. "I almost sat there and cried."

The helicopter returned and lowered the penetrator again, this time closer to Barbee's position.

Barbee let the penetrator hit the ground so he wouldn't get shocked by the static electricity generated by the rotor blades. After being hoisted up and pulled inside, "one of the guys on the helicopter handed me an M16." He was now on watch for the enemy.

When Taschioglou's turn came around again, he said he held the penetrator so tight the Soldiers had to pry his hands loose once he was in the helicopter. As darkness fell, the helicopter picked up Bare and began to leave. Taschioglou said he got up and asked, "'Why are you going? There's more guys down there." That's when he learned that the other Jolly Green had already picked up Corbett, Barkalow, and Iman.

After a brief hospital stay, the seven survivors received a heroes' welcome. They received automatic Purple Hearts for their injuries but no official recognition for their role in the dangerous mission. To Milligan and Waskow, there is no question that the crew of Stinger 41 acted with heroic professionalism throughout the harrowing ordeal.

Flying the mission in daylight over previously identified enemy anti-aircraft guns in a "big, lumbering plane" placed the crew in incredible danger, Milligan said.

"There were several reasons why they deserve recognition—one was just flying that plane over that very dangerous place," Milligan said. "Secondly, they were attacked by some mighty big guns, and they stayed. They just didn't leave … they stuck it out. And then, of course, they get shot down over one of the most dangerous places in Southeast Asia.

THE FIGHT FOR RECOGNITION

In June 2021, the gunship association submitted the first version of a reconstructed awards package. The Air Force returned it requesting more information. Association Vice President, retired Air Force Col. Roy Davis, Waskow, and others revised the package and resubmitted it in January 2022, this time with the backing of Sen. Mark Kelly (D-Ariz.), a Navy veteran and former astronaut.

The decorations board ruled in April, downgrading the Silver Star recommendation for Brown to a Distinguished Flying Cross with Valor and the DFC recommendation for Slagle to an Air Medal. Both had died in the crash. But the board denied the Silver Star for Barkalow, the copilot who stayed with the pilot until the last minutes of flight. It also denied DFC recommendations for the remaining six survivors.

Undaunted, Davis pressed ahead. He sought and won the support of Peters and 24 retired Air Force generals, all of whom had combat experience, and formally requested the board reconsider in May 2024, but the board's original decision was upheld. The board considered the "entire submission anew" in October 2024 and decided "there was no basis to disturb the original decision," Steven Harris, Air Force Personnel Center's director of complaints resolution wrote in a Feb. 28 response letter regarding the decision.

Harris wrote that the board doubted the suggestion that the original awards packages were lost, believing instead that it was "more likely than not, the entire crew of Stinger 41 was duly considered for recognition" in 1972.

Davis questioned that conclusion, noting that among the documents submitted was a signed affidavit from retired Air Force Lt. Col. Charles Pollock, the awards and decorations officer for the 18th SOS, who wrote the original awards package for the crew members in 1972.

Pollock said the original awards package was approved by the squadron commander and wing commander and sent up the chain of command, the affidavit states.

"The entire crew distinguished themselves by extraordinary achievement in combat," Pollock's affidavit states. "It appears that these important awards got lost in the fog of war as we were closing out combat operations."

Davis, a pilot with combat experience, criticized the board's ruling and disputing the notion that the crew "did not meet the criteria" for valor awards. Undeterred, he took his mission to a higher authority, writing on July 4 to President Trump, asking the President to take a "personal interest in this case and help restore justice to these heroes and their families."

Attempts by Air & Space Forces Magazine for comment from the White House, Jenkins, and the Air Force went unanswered by press time.

To Waskow, the crew members' actions throughout the mission's "horrific" conditions "resulted in seven of the 10 surviving." He added that AC-119s flew no more daylight missions because the "air tasking authority realized that was just too dangerous for them."

"We're not doing this because it's a medal hunt," Waskow said. "We're doing this to say thank you to the crew and for the young [Air Force Special Operations Command] kids today to know that people recognize what you do and want to thank you for it, even if it was 55 years ago."

The F-117 Nighthawk ushered in a new era in military aviation: aircraft that could evade radar and penetrate unseen to destroy highly protected targets. The revolutionary stealth rendered obsolete Soviet-style air defenses and paved the way for the graceful curves of next-generation stealth, epitomized by the B-2 bomber and B-21 bombers and F-22 and F-35 fighters.

Staff Sgt. Aaron D. Allmon II

The F-117 and the Future of Stealth

Stealth was a gamble 50 years ago. It's still a good bet.

By John A. Tirpak

Stealth technology has given the U.S. military an air of near invincibility for the past 35 years. Overwhelmingly successful in the 1991 Gulf War, and heavily refined and improved through several generations since, stealth gives the Air Force its "kick down the door" ability to go anywhere and provide the air dominance relied on by the rest of the joint force.

Retired Chief of Staff Gen. David Goldfein said he told President Donald Trump in his first term that, because of stealth, "I can hit any target on the planet that you want me to hit, with incredible precision, and there's nothing the adversary can do to stop me. And that's not something that our adversaries or allies can say. But you have that."

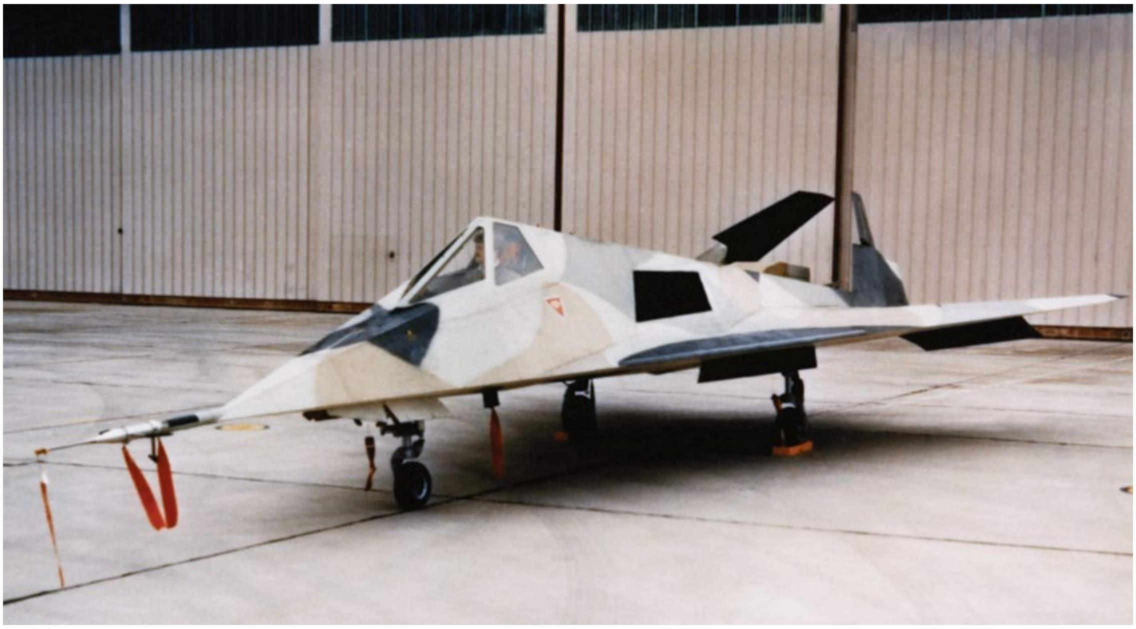
Operation Midnight Hammer, in which U.S. aircraft blew past Iranian air defenses and delivered a severe blow to Iran's nuclear weapons programs in June, was made possible by three types of stealth aircraft—F-22 and F-35 fighters and seven B-2 bombers—all which returned without a scratch.

"The Soviet Union almost spent themselves into obscurity trying to counter stealth."
—Former Air Force Chief of Staff Gen. David Goldfein

In the military arena, though, for every measure there is eventually a countermeasure. The demise of stealth has been predicted many times, as new detection techniques and ever-faster computers proliferate. But experts say those predictions are premature, and stealth will remain an essential Air Force tool for decades to come.

Modern stealth dates back to 1975, when the Defense Advanced Research Projects Agency (DARPA) awarded Lockheed and Northrop contracts to develop experimental aircraft that would be hard to detect and track. Radar-guided antiaircraft missiles had taken a heavy toll on U.S. aircraft in the Vietnam War, and the Soviet Union was spending lavishly on a massive air defense system meant to build an aerial wall the U.S. combat air fleet couldn't breach. America needed a new edge.

If successful, stealth would allow American aircraft to overfly the world's toughest, most heavily defended targets, and render Moscow's massive national investment in air defenses largely obsolete. Stealthy fighters and bombers could approach targets without being detected, then launch their weapons and leave the area before being engaged by defenders.



Lockheed Martin Photography

Lockheed's proof of concept for a stealth fighter was the Have Blue, developed by its famed Skunk Works division. It was the first fixed-wing aircraft design shaped specifically to minimize its radar signature. Lockheed engineers leveraged mathematical models developed by Soviet physicist and mathematician Petr Ufinmtsev, to unlock the potential of stealth.

The idea was to lower an enemy's odds of success at every step in the kill chain: reduce the chance of detection; reduce the chance of tracking if detected and reduce the chance of bringing a weapon to bear if tracked.

Lockheed's Skunk Works advanced products unit was picked to proceed. Given the code name "Have Blue," its prototype aircraft combined overall shaping, surface faceting, and radar-absorbent materials to minimize detection.

Two Have Blues were built, the first flying in 1977. Over the course of an aggressive test program, both crashed, but together they proved the concept could work, paving the way to the F-117 Nighthawk "stealth fighter." Though it was about the size of a large fighter, it was actually a bomber with no air-to-air capability.

In 1980, then-Defense Secretary Harold Brown revealed the existence of stealth technology to reassure the public that the Carter administration, then fighting for reelection, was diligently prosecuting the Cold War with the Soviet Union.

"By making existing air defense systems essentially ineffective, this [technology] alters the military balance significantly," Brown told reporters at a press conference. Stealth had the potential to negate Russia's investment in air defenses.

Brown did not mention how far development had progressed, as those details remained a closely guarded secret.

A year later, the F-117 first flew. Its radar cross section—its apparent size on an adversary radar operator's screen—has been likened to that of a hummingbird.

SECRETS OF THE BLACK JET

Building on the Have Blue foundation, the F-117's shaping would deflect radar energy, returning only a diminished echo to a searching radar. Its faceted skin was a layer cake of radar-absorbent materials, the cockpit windows coated with metal to conceal the radar-reflective pilot's helmet inside. Engine intakes were covered with a radar-deflecting grid, and a flattened and spread-out exhaust was lined with heat-absorbing tiles like those on the space shuttle to minimize its heat signature.

Maintenance was key. The surface of the F-117 had to be painstakingly smooth, and technicians had to spend hours "buttering" caulk and special tape over seams and fastener heads to ensure radar waves couldn't reflect off those bumps.

There was art in F-117 operations, as well. Pilots developed tactics for countering different types of radar, either approaching head-on, from the side, or at various attitudes to minimize detection. A computer program and database—which the pilots called "Elvira" [a possible nod to the pop culture vampire, "Elvira, Mistress of the Dark"]—cataloged all the known air defense radars in the world and presented the optimum flight profile to fly against each one.

In 1983, just three years after Brown's disclosure, the F-117 was secretly declared operational, with 14 jets. The Air Force would add 46 more over the next seven years. They were based at Tonopah Test Range, Nev.—far away from curious eyes—and for eight years, flew only at night, on roundabout routes that took them all over the western U.S. Pilots practiced dropping laser-guided bombs with extreme precision and with precise timing.

Stealth pilots were ostensibly based at Nellis Air Force Base, Nev., but they commuted to Tonopah on an unremarkable airliner every Sunday night, returning on a Friday night, Goldfein noted. It was tough on their dependents.

"They could never tell their families what they were doing," he said. "The level of secrecy was so high that if they ... ever divulged the secret, the penalty was very severe ... it was Manhattan Project-like security."

In 1988, Pentagon spokesman Dan Howard showed the press a grainy, deliberately misleading photo of the F-117 that distorted its size and shape, confirming the open secret that the Air Force had an operational stealth aircraft, and revealing its designation. The jet would soon be integrated into exercises, and the Air Force was seeking to control the revelations as much as possible. The deceptive photo proved highly effective: Most attempts to deduce the angle of the jets' wing sweep and the arrangement of the exhausts, for example, were wildly off the mark.

STEALTH IN ACTION

The F-117 was first used in combat in 1989, during Operation Just Cause, which ended the regime of Panamanian dictator Manuel Noriega. A pair of F-117s were used to drop inert rounds into a field near an army barracks, with the intent of making a big bang to generate panic and confusion among Panamanian troops. There was no intent to destroy anything, and Panama had virtually no air defense systems to evade, so the mission was not a true trial of stealth.

At the outset of the program, Goldfein said, Air Force and

Lockheed officials "thought they could keep it secret maybe one to two years ... maybe." But the secret held until the official rollout in 1990.

The real test came in January 1991, at the start of Operation Desert Storm, when a U.S.-led international coalition moved to eject Iraqi forces from occupied Kuwait. The F-117 led the assault, targeting command-and-control facilities, suspected nuclear weapons research sites, communications nodes, and other strategic targets.

Iraq's military was the fourth largest in the world and operated state-of-the-art Russian air defense systems. Then-Maj. Gregory Feest, who would later retire as a major general, recalled that no one could predict for certain whether this "stealth stuff" would work against sophisticated integrated air defense systems, surface to air missiles (SAMs) and antiaircraft artillery (AAA) fire.

"We trusted the engineers," Feest said in a recent interview. "We were briefed: Here's your signature against these types of SAMs, here's your signature against AAA. But you know, we couldn't verify anything."

Elvira had "all the IADS," Feest said. "It would give us the safest route to get around them."

Some radars wouldn't be able to see the F-117s, but others could, especially at closer range, Feest said. "Our goal was to just minimize our threat time, when we could be seen and tracked."

The Iraqis hurled massive AAA into the sky, Feest recalled. The area around his jet was "just so lit up—the biggest fireworks display I'd ever seen," he said, creating so much light he feared his jet might be visible to the naked eye, and to ground gunners. "I actually thought I was going to get shot down," he said.

Feest lowered his seat and concentrated on navigating, trying to avoid looking outside. With him was a piece of paper listing all the other F-117 pilots also over Iraq that night. After delivering their munitions, they checked in with the tankers for the return journey hookups. Feest listened carefully and heard every call sign.

"I thought, man, we were lucky," he said. The F-117s returned unscathed.

Pentagon

Pentagon spokesman Dan Howard unveiled the first grainy and deliberately misleading images of the F-117, confirming what by 1988 was an open secret: The Air Force had an operational stealth aircraft. By 1991, the world would have a clue of what that meant.

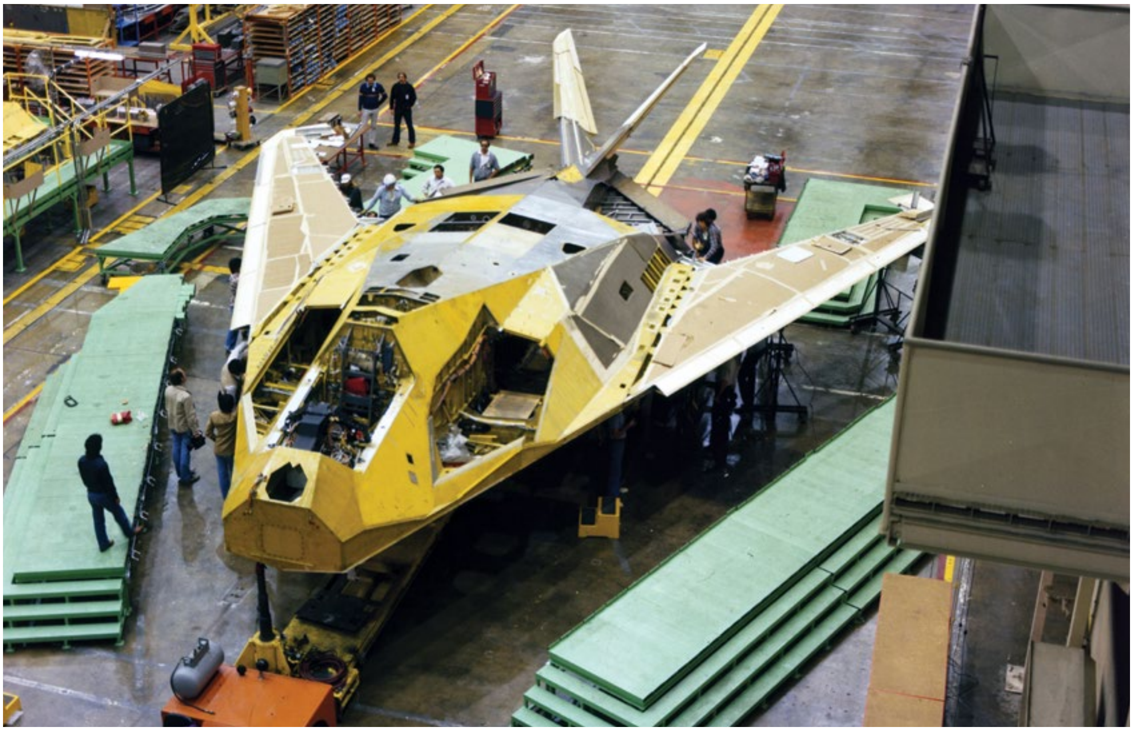
"After a couple of missions, we all decided the engineers did a good job," Feest said, recalling the growing confidence Night Hawk pilots felt as the technology proved itself in battle. "What they told us was true. And we started to feel much better."

The 36 F-117s that deployed for Desert Storm made up just 2.5 percent of the international air armada amassed to pummel Saddam Hussein's forces, yet they destroyed 40 percent of the strategic targets.

LESSONS LEARNED

Desert Storm proved stealth worked, confirming Air Force plans to press ahead with developing the F-22, which was by then in the prototype phase. But the operation also revealed the need for new weapons.

An image of a laser-guided GBU-27 bomb going down an


Pentagon

In this rarely seen image, the underskin of an F-117 Nighthawk is exposed on the factory floor. Lockheed leveraged components from a host of other aircraft to hasten the secret development of the first stealth fighter.

air shaft at an Iraqi headquarters became an icon of that war, but such weapons wouldn't work against targets obscured by clouds, smoke, or dust. In some cases, pilots returned without dropping their bombs, unable to keep the target in sight.

"We needed an all-weather bomb," Feest said, and the Air Force would soon develop one: the Joint Direct Attack Munition, or JDAM. It was fitted with satellite guidance to precisely reach any aimpoint under any conditions, without the need for pilot updates.

Shortcomings of the F-117 were corrected after the war. For example, it had been designed to only allow one bomb bay door to open at a time, requiring two passes at some targets. This was corrected to allow both doors to open and release weapons simultaneously. Also, pilots remained radio-silent during those initial missions because the antennas had to be retracted for full stealth. Conformal, stealth antennas were added later.

The F-117 was officially unveiled to the public in April 1990, only about three months before Saddam invaded Kuwait. The unveiling ceremony at Nellis was followed by air show appearances to show off the technology. In 1992, soon after the Gulf War, the planes were moved from Tonopah to Holloman Air Force Base, N.M.

"I think it's the only program in history that had a top-secret program as its cover," Goldfein added. The F-117 was hidden as part of the Air Force's "Red Eagles" program which obtained and evaluated Soviet-type aircraft and flew them to learn their strengths and weaknesses.

"That was the cover program. ... So if somebody ever saw one, then that was going to be the answer."

UNWELCOME STUDENTS

The "Black Jet," as pilots called it before it received the official nickname "Night Hawk," next went to war in 1999's Operation Allied Force, once again aimed at high-value targets in and around Serbia, which also had Russian-built air defenses. This time, it was joined in action by the B-2 Spirit stealth bomber, developed by Northrop starting in 1981.

Lt. Col. Dale Zelko was the first to discover that the Night Hawk was not invincible. On March 27, 1999, just a few days into Allied Force, his F-117 was hit by a Serbian SA-3 missile. He survived ejection and was rescued, but the remains of the jet were collected by Serbia and, presumably, passed on to Russia and China. Stealth secrets were now in adversaries' hands.

Though Air Force officials continue to be circumspect about exactly what went wrong, the consensus is that the F-117 was hit largely because its flights had become predictable. Serbian forces, abetted by spies near Aviano Air Base, Italy, where the F-117s were based, knew when one took off and could roughly calculate the route it would take. Zelko, said one senior Air Force official, fell victim to a "well-informed guess" about where his airplane would be, and when.

The Air Force had never claimed stealth aircraft were invisible or undetectable, and continued to use the term "low observable"—"LO," and more recently VLO (Very Low Observable) or ELO (Extremely Low Observable) to describe the technology. Radars and computer processors have grown more powerful over the years, and engineers have had to work hard to stay a step ahead. But the word "stealth" has stuck in the public mind.

John Clark, who headed Lockheed's Skunk Works from 2022 to 2025 and is now the company's senior vice president of technology, said it's likely that Serbia provided Russia and China with samples of the F-117's technology and materials. But that was hardly a technological windfall, he said.

USAF

The 37th Tactical Fighter Wing's F-117 stealth fighters line the runway at Tonopah Test Range, Nev., before deploying to Saudi Arabia for Operations Desert Shield and Desert Storm. They would go on to launch Desert Storm's opening strikes.

"I can't say this decisively, but with what I know, and the involvement that I had, there was nothing that we believe was lost, that compromised the capability of the platform," Clark said in an interview. "One of the interesting things with the materials ... is that it's more than a simple 'one-plus-one-equals-two' recipe. There's lots of integrated complexities that come with ... our LO cocktails and the specific material suites that we put together."

Reverse-engineering stealth was not as simple as merely determining what was in the radar-absorbent material, Clark noted.

Even having a sample of the final product, it could be "decades to try to come up with the same material," he said.

Stealth technologies continue to advance. "By the time they actually crack that nut, we'll have already progressed to the next thing," Clark said. In fact, by 1999, the early stealth materials used in the F-117 were nearing "the end of their useful life," he said. "We'd moved on to other stuff."

In 2011, a Lockheed-built RQ-170 stealth reconnaissance drone crashed in Iran, but its damaged fuselage remained relatively intact. Iran claimed it had shot the aircraft down, then insisted it had reverse-engineered it and unveiled a look-alike aircraft to the press. Clark admitted the downed aircraft, also built by Lockheed, "had later materials" than the F-117, but he said a panel of government and industry specialists concluded that, as with the F-117, it would be very hard for Iran to reverse-engineer the RQ-170.

PHASING OUT

After the F-117s were moved from Tonopah to Holloman, pilots were able to lead a more normal family life. Now an open part of the Air Force inventory, it operated there for seven more years. In 2006, with many F-22s in hand and the F-35 on the way, the F-117 era was coming to an end.

Goldfein, then a wing commander at Aviano, got a call from the commander of U.S. Air Forces, Europe, Gen. Tom Hobbins, who gave him his next assignment: We're going to send you out to Holloman … and your job will be to retire the F-117.

Goldfein was all in, despite the fact that the F-117 was younger than most elements of the Air Force combat inventory.

"I think it was … budget constraints—which always make you have to choose between readiness and modernization," Goldfein said. Next-generation stealth was coming online, and that "would take us out of the 'buttering' business and into the more normalized maintenance business."

With the F-22 and F-35 in the fleet, retiring the older and maintenance-intensive stealth technology was "an obvious choice," he said.

Moving from the F-117—designed for rigid attitudes—to the dynamic F-22 posed challenges. The new jet had to perform aircraft-bending high-G maneuvers, which could pull apart seam-filling materials, Clark said. But by then, LO materials science had come a long way.

"Our material suites and the advancements that we made … really dispelled the rumor that the LO was a driving factor at cost for maintenance," he said. "It was no longer even in the top five."

Holloman was slated to receive F-22s, and "we needed the hangars" to house them, Goldfein said. That drove the timing. Collaborating with his successor, Brig. Gen. Jeffrey Harrigian, Goldfein worked to make the transition seamless.

But Congress was not fully convinced that the new stealth aircraft were sufficient, and secretly ordered the Air Force to keep its F-117s in "flyable storage," just in case they were needed for a future war. The aircraft returned to Tonopah, where the wings were removed and stacked beside the fuselages. Goldfein brought in the last one.

Goldfein hesitated a long time before cutting the throttles, he said. "I taxi in, and it's the first time I'm going to ever shut an aircraft down knowing it would never start again," he recalled. "And it's 'code one,'" or fully capable.

In time, some of them would fly again.

LEGACY

Intelligence has shown that "the Soviet Union almost spent themselves into obscurity trying to counter" stealth, Goldfein observed.

The F-117 "probably had as much, if not more impact on that for us during the Cold War as any weapon system on the planet," he said. Stealth is one of those capabilities that cause "potential adversaries to wake up every morning and decide, 'not today.'"

"Flyable storage" means that a small cadre of pilots maintain proficiency in the airplane, and occasionally, one is taken out of storage, fueled, lubricated, and flown.

Since at least 2020, Black Jets have taken to the skies, participating in a number of air exercises, such as Red Flag, Air National Guard wargames, and Northern Edge. While the Air Force acknowledges that some F-117s occasionally fly, their mission is not disclosed. Observers speculate that they play the role of stealthy adversaries, but how long they will continue in that role is anyone's guess.

FUTURE CHALLENGES

The cat-and-mouse advances in stealth and radar technology

Ben Rich (left) sometimes called "the father of stealth," with Kelly Johnson, whom he followed as head of Lockheed's Skunk Works. Shown here at the rollout of the TR-1 in Palmdale, Calif., in 1981, the two were instrumental in the development of the F-117.

Eric Schulzinger

Courtesy

The B-21 Raider, America's newest stealth aircraft, features a refined shape, more durable radar-absorbant coatings, and other advances intended to further the science of low-observability.

continue. Rob McHenry, deputy director of DARPA, suggested in June that the "stealth era" will eventually come to a close.

Quantum sensing, "cross-domain sensing," and artificial intelligence will wear away those advantages as those technologies mature, he said in a visit to AFA's Mitchell Institute for Aerospace Studies.

Quantum sensing seeks to detect extremely small changes in an environment, theoretically making even the stealthiest platform detectable.

DARPA, which focuses on game-changing advanced research, foresees a transition from "quantum sensing as a science to quantum sensing as an engineering discipline," though exactly how soon that will happen is hard to say.

Mark Lewis, who was the Pentagon's director of defense research and engineering during the first Trump administration, said stealth is also evolving.

"There was a step change from the SR-71 to the Have Blue and the F-117, and another step change from the F-117 to the F-22," he said. "And we've heard there's probably another step change to the B-21 and F-47."

Those advances will continue to enhance aircraft survivability, he said, adding, "I'm gonna go out on a limb and say that stealth is going to be part of many of our major systems for quite some time."

Stealth is not about being invisible, but rather about making it "more difficult" to detect.

In the early days of stealth, "you could only calculate [radar cross section] for a portion of the airframe," Lewis said. "And now you can calculate it for the whole thing, and you can make curved shapes where you used to have to do facets. ... We've also gotten better at building stealthy geometries—things that are stealthy from more angles, right?" Whereas early stealth had to be presented to an enemy radar from a particular orientation, "now we've gotten much better at building things that are good from multiple orientations."

The physics hasn't "changed all that much" and remains on a continuum, Lewis said.

Artificial intelligence and computing advances do pose a challenge, though, Lewis acknowledged.

"You could easily imagine a machine learning system that is better at detecting hard-to-see objects like stealth aircraft," he said. "So yeah, it's going to play a role. ... It just means that our adversaries will have better means of detecting these things. But they'll still be hard to detect."

Future developments in aircraft design will also play a role in countering advanced detection. The U.S. has experimented with "shape-changing materials now for decades," Lewis said, technologies that, if producible, would enable "some really interesting things." He said there are "other interesting things you could do if you could change your surface properties, like reflectivity."

Several years ago, photographers spotted F-22s and F-35s sporting a variety of highly reflective, silvery surfaces. The Air Force declined to explain those experiments, and Lewis refused to comment now. "I can't tell you about that for 30 years," he joked. But the bottom line is, "We're going to be using stealth for a while."

There will always be a struggle with what's called the "burn-through" range, Clark said: the point at which, no matter what countermeasures are employed, enemy sensors will be able to see a stealth platform.

"There are going to be places where the adversary just piles so many things up in that area that, yeah ... you're not going to have overflight of those specific areas, but those areas are still going to be relatively small," Clark said.

Stealth will remain part of the Air Force's tool kit for years to come, Goldfein said.

"In most of the countries on the planet, if you were to paint ... a little heat map [of air defenses], we're still pretty viable," he said. "And then, project out 10, 15, 20 years. Guess what? Most of the planet is going to stay about the same. So stealth is always going to be really, critically important, but it'll be combined with other technologies that not only make it better, but make the other technologies better."

Clark said critics like to say they can find a stealth aircraft, but "they can only find the stealth aircraft in a specific spectrum ... when they already know where it is and they can stare the sensor at it." It's like a needle in a haystack, he said.

"If I'm sitting in the haystack and somebody drops the needle on my lap, I can find the needle. But if the needle is in the middle of the haystack, there's no way you're actually going to find it, even though it's in there."

To stop a low-observable aircraft from achieving its objective, Clark said, "You have to detect, and you have to track, then you have to engage before you can kill." If all the sensor operator sees is "an intermittent detect, and you see it for three seconds out of a 30-minute window, that's not useful."

Ohio

JobsOhio®

GROW BIGGER. SUCCEED FASTER.

HAVE IT ALL IN ONE OF THE
NATION'S MOST MILITARY-FRIENDLY STATES.

Next-generation stealth, in the form of a B-21 Raider bomber during flight tests at Edwards Air Force Base, Calif., is foundational to the U.S. ability to hold adversaries at risk with forces that can overcome advanced air defenses.

The Force We Need: Stand-off and Penetrating Airpower

How the U.S. can counter China's size and other advantages.

By Col. Mark A. Gunzinger, USAF (Ret.), and Heather R. Penney

Winning the Next War: Overcoming the U.S. Air Force's Capacity, Capability, and Readiness Crisis

Mark Gunzinger is Director of Future Concepts and Capability Assessments and Heather Penney is Director of Studies and Research at AFA's Mitchell Institute for Aerospace Studies. Download the entire report at *http://MitchellAerospacePower.org*

Decades of force cuts and deferred modernization have left the U.S. Air Force unable to simultaneously deter nuclear attacks, defend the U.S. homeland, and defeat Chinese aggression at acceptable levels of risk. Years of insufficient resources have also eroded the Air Force's ability to conduct long-range, penetrating attacks against China's centers of gravity and deny the operational sanctuaries the People's Liberation Army (PLA) needs to generate air and missile attacks against U.S. bases in the Pacific. The net result: China holds a decisive advantage in combat mass that cannot be overcome by the United States and its allies and friends.

It is not enough for the U.S. to simply prevent the PLA from seizing ground on the shores of Taiwan. That by itself will not guarantee victory. A war-winning strategy must also deny sanctuaries to the PLA—including sanctuaries on China's mainland—and enable U.S. forces to degrade China's ability to launch long-range air and missile salvos that could cripple U.S. joint force operations in the Pacific.

But such a war-winning strategy requires a war-winning force structure to ensure the U.S. has the capability and capacity to defeat a Chinese invasion of Taiwan and deny the PLA sanctuaries from attacks.

The Air Force will soon field next-generation bombers and fighters with the range, survivability, and payload capacity to deny sanctuaries to PLA forces wherever they are. But these will be of little value unless the service acquires enough of them.

Multiple studies have concluded the USAF needs at least 200 B-21 Raider bombers to meet operational demand for penetrating strikes. Stealthy F-47s and F-35As, supported by uncrewed Collaborative Combat Aircraft (CCA) and F-15EX stand-off strike aircraft, are also required at scale. Yet the Air Force is acquiring new fighters below the sustainment rate necessary to maintain its combat inventory. Delaying or truncating any of these acquisition programs now would create a fragile force unable to take the fight to China—a force incapable of achieving peace through strength or of winning should deterrence fail.

DENY SANCTUARY

History has repeatedly demonstrated the imperative to deny operational sanctuaries that enable adversaries to husband resources, produce war materiel, train replacement warfighters, secure military leadership, and protect their lines of communication. Because freedom from attack is crucial to enable the freedom to attack, denying sanctuaries is an essential element of any successful warfighting strategy.

The daring April 1942 Doolittle Raid on Japan highlights the strategic value of denying sanctuary. Although it inflicted only minimal damage, the Doolittle Raid drove Japan's high command to withhold four fighter groups for home island defense, stretching Japan's remaining forces across its occupied territories in the Western Pacific. By 1944, U.S. long-range B-29 bombers were devastating Japan's war industry, training sites, and military bases—denying the sanctuaries that had enabled Imperial Japan's expansionist aggression in the first place. Ultimately, it was those long-range penetrating attacks that pushed Japan to its unconditional surrender in August 1945. In Europe, long-range B-17 Flying Fortress and B-24 Liberator bombers likewise denied sanctuary to Germany, disintegrating their war industries, will, and combat power.

Nearly five decades later, Operation Desert Storm likewise demonstrated how an air campaign can deny sanctuary to an adversary. Employing an effects-based strategy to attack multiple centers of gravity deep within Iraqi territory, planners leveraged stealth and precision-guided munitions to paralyze the Iraqi army's ability to wage war. No area or target in Iraq was off-limits, and the overwhelming pace and volume of airstrikes utterly collapsed the Iraqi military. The USAF campaign to deny sanctuary resulted in one of the most stunning military successes in history.

Penetrating airpower, however, is only effective if national leaders are willing to employ it. History provides many unfortunate examples where militaries that are unable or unwilling to deny sanctuary were reduced to waging force-on-force attrition campaigns, a self-defeating form of warfare.

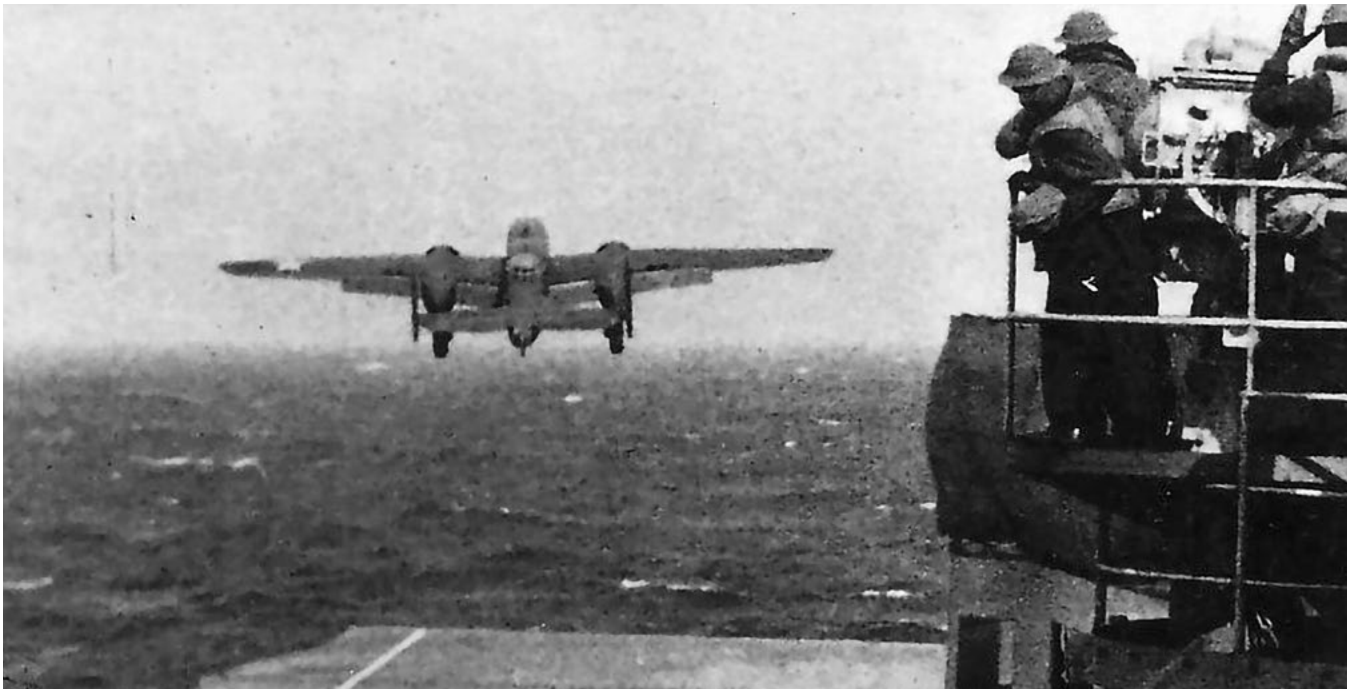
Consider President Harry S. Truman's desire to limit the Korean War. By restricting U.S. military operations, he effectively allowed China to support North Korea's forces nearly unhindered. The United States also tightly restricted targets during the Vietnam conflict, focusing air operations on interdicting fielded forces and reactive, defensive strikes. By ceding the operational advantage and effectively granting sanctuary to North Vietnam and its state sponsors, the United States prolonged the conflict and ultimately failed to achieve its aims.

Today's Russia-Ukraine war further demonstrates how the inability to deny sanctuaries leads to strategic stalemate. U.S. restrictions on the use of weapons supplied to Ukraine, for example, have shielded Russian combat forces, command and control, logistics, and rear area support services, providing Russia the sanctuary's asymmetric advantage. As President Donald Trump said, "It is very hard, if not impossible, to win a war without attacking an invader's country. It's like a great team in sports that has a fantastic defense, but is not allowed to play offense. There is no chance of winning!"

The lesson from these historical examples is clear: Fighting a war of attrition and interdiction unnecessarily draws out conflicts and leads to suboptimal outcomes. Denying sanctuary to an adversary is a powerful way to rapidly prevail in a conflict—and only airpower can conduct strategic attacks at the scale, tempo, and concentration required to do so and collapse an adversary's ability to sustain combat operations. Yet to do that, an air force must be resourced with the capabilities, aircraft, and munitions to penetrate adversary air defenses, execute their missions, and return to fly again.

OLDER, SMALLER, LESS CAPABLE

Today's Air Force does not reflect these principles. Among an inventory of 141 bombers, just 19—or 13 percent—are capable of long-range, penetrating strikes. Those 30-year-old B-2 Spirits are the entirety of the nation's penetrating bomber force. Of the Air Force's 2,000 fighters, only 20 percent



USAF

America's first penetrating strike of World War II, the famed Doolittle Raid of April 18, 1942, stunned Imperial Japan and forced its military to hold back forces for homeland defense.

are stealthy F-22s or F-35As. And none boast an unrefueled mission radius exceeding 700 nautical miles. This is not a resilient force that can sustain operations against highly capable adversaries like China; it is too small to absorb aircraft losses in peacetime, let alone in time of war.

By contrast, the PLA Air Force is growing. China now fields the largest aviation force in the Indo-Pacific region, and the third largest in the world, according to the U.S. Air Force. The PLAAF now owns more than 1,900 fighters, including fifth generation J-20s and more than 225 J-16s that can carry very long-range air-to-air missiles. The PLA is also developing advanced capabilities. Its stealthy, long-range Xi'an H-20 bomber, in development since 2016, could enter production in the next few years. Two sixth-generation fighters, the Shenyang J-50 and the Chengdu J-36, are also in development. The J-36 could be a fighter-bomber hybrid, given the size and apparent volume of its weapons bays.

To course-correct and rebuild the Air Force's sanctuary-denial capability and capacity, it must field the B-21 as the foundation of its long-range strike family of systems. Air Force leaders have said they need at least 225 bombers—a mix of next-generation stealthy B-21s and nonstealthy B-52Js. The B-21's advanced stealth—a low-observable flying wing shape, next-generation coatings to absorb radar, and other advanced technologies—give it the all-aspect, broadband stealth necessary to penetrate advanced integrated air defenses. Like the B-2, the B-21 is equipped with systems that can fuse information from multiple onboard and off-board sources and smart mission planning tools to help pilots avoid high-risk threats.

Combined with sixth-generation F-47 fighters and uncrewed CCA, B-21s will vex China's air defenses with a far more credible challenge. This combination will complicate adversaries' ability to accurately characterize threats, causing them to expend defensive assets against decoys and other lower-value capabilities instead of piloted aircraft.

STAND-OFF COMBAT AIRPOWER IS NOT ENOUGH

Rebuilding the Air Force's bomber and fighter inventory will not be cheap, and air defenses are becoming ever more lethal. That's why some defense planners are pushing to shift the balance of U.S. forces toward stand-off attack. These planners see stand-off aircraft and weapons as the only viable way to survive in a peer conflict. But such a shift risks an even more fragile USAF force design, one that increases reliance on completing long-range kill chains at an unprecedented scale during a peer conflict.

The problem is that greater reliance on stand-off systems and their long-range kill chains gives adversaries more opportunities to counter U.S. strikes, through both kinetic and nonkinetic means. In the opening days of conflict, when the U.S. would need to complete thousands of long-range air-to-air, air-to-surface, and surface-to-surface kill chains, those risks are greatly increased. Indeed, they are beyond current U.S. Air Force and Space Force capacity. Yet even as these critical kill chains mature technologically, the increased complexity of their sensor networks and datalinks will continue to be vulnerable, increasing opponents' opportunities to disrupt the flow of information from sensors to shooters.

Shifting toward stand-off attacks also ratchets up the cost of munitions needed to strike a given set of targets. Like combat aircraft, munition costs are determined by technological variables: range, stealthiness, warhead size and weight, and even inflight speed. As these increase, so do weapon costs,

Chase Kohler

The heart of the U.S. stand-off force is the B-52 force. Soon to be fitted with new engines, radars and flight controls, the Stratofortress can deliver long-range cruise missiles and others weapons from a stand-off distance.

Courtesy

The fourth-generation F-15 and F-16 fighters that crushed Iraq's military in 1991's Operation Desert Storm lack stealth and other advances endemic to fifth-generation fighters, but they can still provide capabilities as follow-on and stand-off forces in the modern era.

with some long-range surface-to-surface missiles costing tens of millions of dollars each. In the case of the U.S. Army's new Long-Range Hypersonic Weapon, those costs could be far higher.

Cost translates directly into the number of weapons the nation can afford to acquire, and therefore the number of targets it can strike. It also defines the force's resilience in a protracted conflict.

China, Russia, and other adversaries routinely protect their high-value military assets in hardened shelters. But defeating hardened shelters requires the use of more or larger munitions, while stand-off munitions must, out of necessity, carry smaller and lighter warheads to travel long distances. Even when used in multiples, stand-off weapons may not be able to penetrate hardened and deeply buried facilities. This is why the Air Force acquired short-range penetrating munitions like the 5,000-pound-class GBU-72/B bunker buster bomb and the 30,000-pound GBU-57A/B Massive Ordnance Penetrator (MOP). These munitions demonstrated their effectiveness on such targets in Operation Midnight Hammer against Iran's nuclear facility in June. Only stealthy aircraft can deliver such large penetrating weapons in contested areas.

The inability to reach distant targets is another limiting factor for stand-off attack weapons. The air-launched Joint Air-to-Surface Standoff Missile-Extended Range (JASSM-ER) and its variants acquired by DOD have ranges of more than 500 NM, while the Navy's Tomahawk cruise missile can reach targets located 1,000 NM or more from their launch platforms. These and other stand-off weapons are critical to preventing a Chinese *fait accompli* operation to seize Taiwan, but their effective target area coverage would be reduced significantly if they are launched at distances of 800 NM or more from China's coastline. Such distances would greatly reduce the utility of using stand-off strike platforms alone to deny sanctuary to PLA forces stationed deep within China's interior.

RESTORING PENETRATING AIRPOWER

The Air Force is the only U.S. or allied service that operates long-range bomber aircraft. Once it acquires the F-47, it also will be the only one to fly long-range stealthy fighters. Ensuring the USAF has the right mix of nonstealthy, stand-off, and stealthy penetrating aircraft must now be a national imperative. The Air Force has long held that it requires both stand-off and penetrating aircraft and munitions in its force design. Having both in combination poses a more complex threat to opposing forces and increases the Air Force's options to create war-winning effects.

The Air Force must be properly sized to do three things simultaneously:

- Create war-winning effects in a peer conflict
- Deter nuclear attacks
- Defend the U.S. homeland.

To do all three, the U.S. should procure B-21s at an accelerated rate and acquire at least 200 aircraft. Combined with B-52s that are projected to remain in service until 2050, this would more than double the Air Force's current long-range strike sortie capacity. This inventory would still be smaller than the bomber force DOD fielded throughout the Cold War.

Similarly, the U.S. Air Force must retain and modernize its F-22 fleet, increase the pace of F-35 procurement, and accelerate F-47 development. From a force mix perspective, the F-47's unmatched low observability, range, and payload is crucial to rebalancing the service's combat forces for peer conflict—but it does so only if purchased in volume. Even the most capable F-47 can only be in one place at a given time, which is why far more than 185 F-47s will be needed to meet growing demand for long-range combat airpower—especially in the vast Indo-Pacific theater. F-47s operating with B-21s and other aircraft in the Air Force long-range strike family of systems will be the backbone of DOD's sanctuary denial force.

The Air Force now has a once-in-a-generation opportunity to rebuild the sanctuary denial capacity that the U.S. military and our allies depend upon. The U.S. Congress should fully fund the Air Force's F-35 and F-15EX procurement accounts and robustly resource the F-47 and B-21 programs to accelerate their pathway to full production by investing additional

Master Sgt. George Perkins

Range is a critical factor in a Pacific war, where aerial refueling is critical to enabling penetrating jets like the F-22 Raptor to reach well-protected targets that stand-off forces cannot reach.

funds beyond those planned today. Without that additional funding, the Air Force will struggle to keep both the F-47 and B-21 programs on track.

Together, the B-21 and F-47 can deny sanctuaries to China's forces and enable U.S. airpower to collapse the PLA's capacity to sustain large-scale air and missile attacks against allied forces in the Pacific. No other existing or planned U.S. combat systems provide a similar unilateral capacity to strike dynamic targets at the scale and tempo necessary and over the long ranges required to reach high-threat-density areas. The Mitchell Institute recommends:

- The Air Force should conduct cost-per-effect analysis to inform its development of a balanced mix of long-range penetrating and stand-off combat aircraft and munitions. Such an analysis should factor in the entire system-of-systems that long-range kill chains require to be resilient and effective at the scale needed in a peer conflict. Failure to consider all aspects of these kill chains will inevitably distort their actual cost per effect.
- Congress and the Department of Defense should provide the U.S. Air Force with at least $5 billion more per year to nearly double its planned B-21 acquisition and create a bomber force capable of denying operational sanctuaries to the PLA.
- Congress and the DOD should support the acquisition of at least 300 sixth-generation F-47 NGAD fighters as part of the Air Force's future force design. F-47s and B-21s, working in combination, will be able to strike any target on China's mainland to deny sanctuary and eliminate capabilities critical to the PLA's air and missile forces.
- The Air Force should refrain from retiring its stealthy B-2s until a sizable force of B-21s—surpassing 100 aircraft—is fully operational in the 2030s. Maintaining the current force of stealthy bombers would hedge against B-21 program risk and increase the Air Force's penetrating strike capacity over the next 10 years when the threat of Chinese aggression may be greatest.
- The Air Force should accelerate purchases of current-generation F-35As and F-15EXs to rapidly modernize the fighter force. Acquiring 74 F-35A and 24 F-15EX fighters per year will reverse decades of force cuts and provide a vital hedge against future risk. These aircraft will help create a balanced penetrating and stand-off force mix for conducting long-range precision strikes, including attacks against maritime targets, counterair operations, electromagnetic warfare, and other missions. They will also increase the Air Force's capacity to team its piloted aircraft with uninhabited CCA to achieve affordable mass—a necessity to help counter the PLA's combat mass advantage.

Long ranges, large payloads, precision weapons delivery, and survivability remain foundational requirements for modern combat aircraft that are designed to deny sanctuaries. Moreover, U.S. air forces must have enough long-range aircraft and munitions to do so with sufficient tempo and concentration over time. Failing this, the United States could face a costly, bloody, and drawn-out conflict with devastating losses. The United States must make the investments necessary to rebuild the nation's long-range, penetrating bombers and fighters—or risk losing the next war.

The Air Force now possesses more than 500 F-35A Lightning II stealth fighters, second in the inventory only to the F-16. The superior situational awareness, enabled by its fifth-generation sensors and superior computational power, is a crucial advantage of the aircraft because it refers to the singular "superior situational awareness."

Tech. Sgt. Mikayla Gibbs

PAID ADVERTISEMENT

Protect What Matters Most with AFA Term Life Insurance

Life insurance is one of the most important financial tools you can have—yet it's often misunderstood or overlooked. According to the 2024 Insurance Barometer Study, 42% of U.S. adults—representing over 102 million people—say they need (or need more) life insurance[1]. That gap in coverage can leave families vulnerable to financial hardship if the unexpected happens. Whether you're just starting a family, buying a home, or nearing retirement, having the right life insurance coverage in place is a critical part of a sound financial plan.

As an Air & Space Forces Association (AFA) member, you understand the importance of service, security, and preparedness. This September, during Life Insurance Awareness Month, it's the perfect time to ensure your loved ones are protected—no matter what the future holds.

One of the most valuable benefits of your AFA membership is access to exclusive group Term Life Insurance coverage. Designed with the unique needs of military families in mind, this plan offers specially negotiated rates and flexible protection that helps safeguard your family's financial future.

Why Choose AFA Term Life Insurance?

- Exclusive Member Rates – Enjoy group pricing not available to the public.
- Coverage You Can Count On – Apply for up to $500,000 in benefits for yourself and $100,000 for your spouse.
- No War or Terrorism Exclusions – Unlike many policies, this plan covers you even in the most extreme circumstances.
- Easy Application Process – Apply online in minutes with no obligation.
- Living Benefits – Access a portion of your benefit early if diagnosed with a terminal illness.
- Portability – Take your coverage with you, even if you leave the military or change jobs.

Endorsed by the AFA, this plan offers the financial security that your family deserves.

SUPPORT THE MISSION WHILE PROTECTING YOUR FAMILY

When you enroll in AFA Term Life Insurance, you're not just protecting your family— you're also supporting AFA's mission to advocate for the Air and Space Forces and their families. Every policy helps fund programs that benefit the entire AFA community.

Secure your family's future with AFA's term life plans – because their happiness is your peace of mind.

Take the First Step Today

Visit **https://www.afainsure.com/coverages/life-insurance** to learn more and apply for Term Life Insurance. It's fast, easy, and secure.

[1] https://www.limra.com/en/newsroom/industry-trends/2024/life-insurance-awareness-month-a-time-to-help-more-consumers-get-the-life-insurance-coverage-they-say-they-need/

Group Term Life Products Underwritten by New York Life Insurance Company, New York, NY 10010 on Policy Form GMR-FACE/G-30290-0, 30291-0, 30293-0, 30294-0, 31220-0

PAID ADVERTISEMENT

Courtesy

Louisiana Air National Guard F-15 pilot Capt. Cody Kirlin fought a three-year legal battle with the Air Force to overturn a baseless determination that his 2019 spinal injury was not incurred in the line of duty.

Airmen Injured On Duty—Why Isn't the Air Force Paying?

Receiving disability compensation has become a complicated process.

By David Roza

Capt. Cody Kirlin was deployed to Guam in 2019 when he woke one morning with severe neck pain. Examinations revealed the Louisiana Air National Guard F-15 pilot had two herniated discs in his spine, a relatively common injury among fighter aviators, given their high-G maneuvers.

What began as a painful injury has driven a debilitating wedge between the Air Guardsman and the military he had faithfully served since joining the Air Force in 2014. Twice the National Guard Bureau has determined Kirlin's injuries were sustained in the line of duty, yet even now, six years later, Kirlin has received no Defense Department disability compensation, and he and his civilian employer have had to pay thousands of dollars to cover his two spinal surgeries.

Kirlin is among hundreds of Air National Guard and Air Force Reserve members who apply for and are denied disability benefits each year, the military having determined that their injuries were not sustained in the line of duty and therefore not worthy of military compensation.

Inconsistent language and interpretations are an ongoing problem, … which has led to errors in LOD procedural accuracy.

Air Force and Defense Department regulations say a Reserve Component member hurt while on Active-duty for more than 30 days is presumed in the line of duty until "clear and unmistakable evidence" shows otherwise, but rarely do officials provide such evidence.

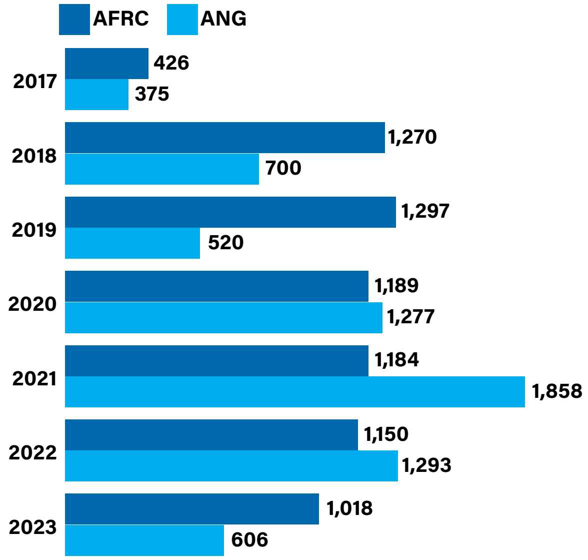
In Kirlin's case, the National Guard Bureau has, since 2022, insisted without evidence that Kirlin's injuries were not sustained in the line of duty, even though it has twice before determined those injuries were sustained in the line of duty.

"It just makes my blood boil," Kirlin said. "All this takes is one person to be a good human and do the right thing. But instead they choose to battle on every single point, and with the goal of retaining me without benefits."

An Air Force Inspector General report released in February portrayed a military disability health system where inadequate training, poor communication, and zero oversight leave Airmen confused, distrustful, and with few avenues for recourse when their service branch disputes their claims that their injuries were sustained in the line of duty (LOD).

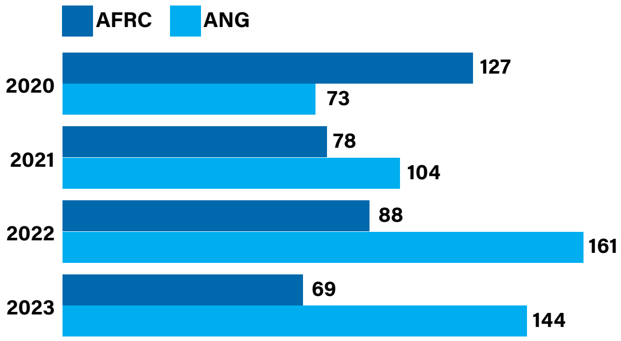
Number of Line of Duty (LOD) Determinations

The number of LOD determinations that the National Guard Bureau and Air Force Reserve Command processes every year varies widely due to new ways of tracking and processing cases and corresponding policy changes.



Days to Process LOD Determinations

An Inspector General report found long wait times for LOD determinations. There is no oversight ensuring wings meet the 60-day deadline of processing the initial paperwork, and troops do not receive updates on the status of their LOD cases as they move through the system. The numbers below do not account for the time needed to gather medical documentation.



Sources: National Guard Bureau and Air Force Reserve Command

"[Air Reserve Component] wing, NGB, AFRC, and DAF are lacking LOD program oversight. There is no current adequate oversight of the LOD program at any level," the report said.

LINE OF DUTY

The problems stem from gaps in health insurance coverage. Active-duty members are covered by Tricare, the military health insurance program. But members of the Reserve Component (RC)—comprised of the Guard and Reserve—are not necessarily covered by the same system. Those that choose may acquire Tricare coverage in exchange for paying a monthly premium and copayment, but once on Active-duty orders for more than 30 days, they are automatically covered by Tricare at no cost.

For RC members hurt in the line of duty to receive long-term medical care and disability compensation, they must receive an in line of duty (ILOD) determination, which certifies that the medical condition was incurred or aggravated during military service.

An ILOD is the key to Defense Department and VA disability benefits, including medical retirement, which includes lifetime medical care under Tricare. A VA disability rating entitles recipients to lifelong disability payments, which unlike military retired pay are not generally taxable.

If a condition is determined to have been ILOD, then the member may remain on Active-duty until the condition is resolved or the member completes the disability evaluation system (DES) process, which determines whether the member can continue to serve and, if not, whether disability benefits are in order. Extending Active-duty orders requires the Air Force to issue Medical Continuation (MEDCON) orders.

If the Air Force rules the condition is not in the line of duty (NILOD), it is almost impossible to receive a disability rating from either the DOD or VA systems, according to the Government Accountability Office.

To start the LOD process, service members file medical records and paperwork with the local military medical provider, who offers an opinion to the immediate commander, who makes an interim LOD determination. The commander also makes an initial recommendation whether the condition is ILOD or NILOD before it goes on to an Air Reserve Component (ARC) LOD determination board, a panel of medical and legal specialists and personnelists who make the final determination.

The Air Force Reserve and the National Guard Bureau each have ARC LOD determination boards, and the final decision authority for each board rests with the top personnel official for AFRC and NGB, respectively. Spokespeople for both components said the ARC LOD boards' decision aligns with local commanders' recommendations about 84 percent of the time. It is the local commander's responsibility to brief the service member on the LOD determination.

The number of LOD determinations that the National Guard Bureau and Air Force Reserve Command process every year varies wildly, according to data the two agencies sent to Air & Space Forces Magazine. Significant discrepancies were also identified in numbers provided pursuant to individual Freedom of Information Act requests.

An NGB spokesperson owed the wide range "to administrative changes—new ways of tracking and processing cases, and corresponding policy changes," as well as the COVID-19 pandemic, which saw a large number of activations.

From 2020 to 2023, about 80 percent of AFRC and ANG cases were found to be in the line of duty, with the most common cases being COVID-19 and acute musculoskeletal injuries such as sprains, strains, fractures, and lacerations. For NILOD cases, the most common included degenerative disc disease, osteoarthritis, hernias, and sleep apnea. Post-traumatic stress appeared among the top five conditions on both the ILOD and NILOD lists.

It takes a while to process a line of duty claim: the NGB ranged from 73 days in 2020 to 144 in 2023, while AFRC ranged from 127 days to 69 over the same period, though that does not count the time needed to gather medical documentation from members or providers.

There is no oversight ensuring wings meet the 60-day deadline of processing the initial paperwork, the Inspector General wrote. The Guard and Reserve components were "busting timelines left and right," one Air Force personnel expert told the IG.

"Adjudications of LODs were going a year, two years almost," the expert said. "And we needed a line of duty adjudicated much more quickly than 480 days, or 600 days, right? Because the line of duty is the key to everything."

Missing the deadline by eight to 10 times the requirement became the norm due to: "Staffing resources, operational requirements, and insufficient documentation," an AFRC spokesperson said.

Matthew Schwartzman, legislation and military policy director at the nonprofit Reserve Organization of America (formerly known as the Reserve Officers Association), said he'd spoken with about 20 members about their LOD. "Every single member that I spoke with encountered an issue with the line of duty determination process," Schwartzman said.

Courtesy

Louisiana Air National Guard F-15 pilot Capt. Cody Kirlin fought through the pain of his spinal injuries incurred on duty and also fought for his disability rating along the way.

'COMPLETELY BASELESS'

According to Air Force and Defense Department regulations, when a Reserve Component member is hurt while on active orders for more than 30 days, the condition must be considered ILOD unless the government shows through "clear and unmistakable evidence" that the condition existed prior to service and that it was not service aggravated. Clear and unmistakable means the evidence is undebatable.

But advocates and the IG report say the government almost never meets that standard.

"ARC service members are not provided sufficient feedback or evidence explaining why their medical conditions were found NILOD," the report said. One senior enlisted LOD program manager (PM) told investigators that members are usually provided standard language out of medical literature that is very difficult to understand or explain.

In Kirlin's case, the ARC LOD board had determined twice by August 2021 that the pilot's injuries, cervicalgia and cervical radiculopathy, were ILOD; consistent with more than a dozen official Air Force records which also say that the injuries have not been resolved.

Kirlin was put on nonflying status and entered into the disability evaluation system. Kirlin retained his civilian job as an airline pilot, since flying airliners does not involve high G-forces, as flying fighters does.

But in December 2021, things went awry. An informal physical evaluation board (IPEB) compared an MRI taken in July 2021 with a made-up one from January 2021, one which the Air Force three years later admitted never existed.

The non-existent MRI found a new herniation in the July image indicating a new injury. That panel directed a review by the National Guard Bureau. One year later, in December 2022, the NGB determined that the original ILOD injury had been resolved and then aggravated by "an intervening event, i.e., bike ride and/or civilian flying activities." The board concluded that the original injury had healed and the re-injury was not related to military service; they nixed Kirlin's eligibility for medical retirement and benefits.

Col. (Dr.) Lisa Weeks, chief of NGB's clinical case management, approved the NGB review, though she is an obstetrician/gynecologist and not a specialist in spine injuries.

Lt. Col. (Dr.) Wesley Vanderlan, the former senior medical examiner for the Louisiana Guard's 159th Medical Group and a trauma surgeon who specializes in spinal surgery, also reviewed Kirlin's record.

"I cannot emphasize enough that these conclusions from the IPEB are completely baseless," Vanderlan wrote in a 22-page appeal of the NGB's findings sent to the Air Force Personnel Council in 2023.

Able to perform only limited administrative duties since 2019, Kirlin is still required as a member of the Air National Guard to fly from his home in Colorado for monthly drill weekends in Louisiana, where he does computer-based training and other busy work before flying home. While the Guard covers lodging expenses, he receives no travel pay.

The NILOD determination means Kirlin does not receive Tricare Prime—which is health insurance without premiums or a co-pays—and loses possibly thousands of dollars a month in disability compensation.

Kirlin appealed the NILOD in November 2023 to the Secretary of the Air Force Personnel Council, submitting a 14-page legal memorandum with 33 exhibits in support, including Vanderlan's 22-page statement. In January 2024, the council responded with a one-page memo. SAF/PC acknowledged "agency errors" in making a determination "based on a nonexistent [MRI]." But those errors did not prevent the review board "from making an informed decision." SAF/PC acting Deputy Director Col. Selicia Mitchell concluded all of Kirlin's spine injuries were incurred outside of military duty—overruling nearly every other official Air Force record.

Kirlin's lawyers question those results: "It is entirely unclear how an abundance of objective, clear medical evidence, and highly favorable DOD guiding regulations, could have led to a one-page sweeping denial of the LOD appeal," they wrote in a statement to the Air & Space Forces Association.

'CANNED LANGUAGE'

Regulations let officials justify NILODs "through reference to medical literature," and in most cases that is the only explanation members receive, said Brenda Gohr, an attorney who represents service members in LOD determination appeals. Gohr is a lieutenant colonel in the Air Force Reserve, but she spoke as a private attorney, not on behalf of the Air Force.

"They have moved from canned language that states 'after consulting with authoritative medical literature' to canned language that states 'references include accepted medical principle, meta-analysis from UpToDate, along with guidelines from the American Academy of Orthopedic Surgeons,'" Gohr said. "That isn't specific evidence that a service member can refute."

Airmen and wing-level LOD program managers voiced the same critique in the Inspector General report. Members also cannot track the progress of their LOD, nor are they briefed on how the LOD process works.

"This lack of understanding is exacerbated by inadequate and, at times, non-existent methods of communication among

FOR THE MILITARY COMMUNITY AND THEIR FAMILIES

USAA has been proudly serving those who serve since 1922. Today, we're still supporting them and their families with insurance, banking and retirement solutions to fit their needs.

usaa.com

USAA®

INVESTMENTS/INSURANCE: NOT A DEPOSIT • NOT FDIC INSURED • NOT BANK ISSUED, GUARANTEED OR UNDERWRITTEN • MAY LOSE VALUE

Use of the term "member" or "membership" refers to membership in USAA Membership Services and does not convey any legal or ownership rights in USAA. Restrictions apply and are subject to change. To join USAA, separated military personnel must have received a discharge type of Honorable or General Under Honorable Conditions. Eligible family members may also join USAA. USAA Federal Savings Bank offers deposit, credit card, consumer lending, mortgage and other banking products and services. USAA Federal Savings Bank is a Member of FDIC. Credit card, mortgage and other lending products not FDIC-insured. All insurance products are subject to state availability, issue limitations and contractual terms and conditions. Each company has sole financial responsibility for its own products. Property and casualty insurance underwritten by United Services Automobile Association (USAA), USAA Casualty Insurance Company, USAA General Indemnity Company, Garrison Property and Casualty Insurance Company, NOBLR Reciprocal Exchange, based in San Antonio, Texas; USAA Limited (UK) and USAA S.A. (Europe) and is available only to persons eligible for property and casualty group membership. Each company has sole financial responsibility for its own products. Coverages subject to the terms and conditions of the policy. No Department of Defense or government agency endorsement. © 2025 USAA. 6806649.0824

service members, wing leadership, program managers, and the ARC LOD approval authorities," the report found.

Master Sgt. Jim Buckley, a tactical air control party (TACP) Airman with the Mississippi Air National Guard, started suffering migraines following an airborne training injury. The ARC LOD board found the issue unrelated to his service. He has yet to be told why.

"At every level of appeal since then," wrote Buckley's lawyers, "… he has raised this issue, requesting the Air Force provide him the evidence purportedly relied on. Every time he has requested it, his requests have been rejected or ignored."

Nor did the National Guard Bureau explain why it overturned an ILOD determination for Lt. Col. Christy Kjornes, a KC-135 tanker pilot in the Arizona Air National Guard. Kjornes requested not to publish the exact conditions to protect her privacy, and said she was initially hesitant to report her symptoms for fear of being grounded.

"Operators know on a professional level how to keep our mouth shut, so we can employ those skills when it comes to our personal health," she said. "Once you suppress that long enough, then things really start to fall apart."

While attending Air Command and Staff College at Maxwell Air Force Base, Ala., in 2020, Kjornes' condition worsened. Her commanders and medical providers made an initial ILOD determination, which should have kept her on medical continuation (MEDCON) orders. But her Guard unit concluded otherwise.

When Kjornes returned to Arizona, her MEDCON orders were denied and the 161st Air Refueling Wing ordered an electronic version of the LOD determination form. It took nine months, and the resulting document left out one of her diagnosis codes and downgraded another to a less serious condition. The wing did not explain either action, and the NGB upheld the NILOD determination.

"There was zero evidence, just a generic reference to medical literature," Kjornes said. "Nothing specific to me or my medical record."

Now, however, suffering health issues and denied a line-of-duty determination, she was without pay and benefits and, lacking a civilian job, she had no income.

"I had no idea how long that was going to go on for, but the writing on the wall was that the appeal might not get approved," she said. "So I thought I should probably offload my house and my mortgage before I completely depleted all of my savings."

LACK OF TRAINING

In 2019, Buckley felt something give in his shoulder while carrying sandbags for a fitness test. "I thought I pulled a muscle," the TACP said. But "from that point on, it just continued to get worse."

Just like Kjornes, Buckley was taught to avoid reporting medical conditions. The reluctance to report medical issues is an added problem for members of the National Guard and Reserve, where "immediately reporting the health condition to command is the best way to obtain an affirmative LOD determination," the Government Accountability Office wrote in a 2023 report.

"The more time that passes between the reserve component member developing a health condition and obtaining an LOD determination, the more difficult it becomes to demonstrate that the health condition developed during military service versus civilian life," GAO wrote.

But the reserve components don't often tell members this: All 15 stakeholders who the GAO interviewed said RC members do not always understand the importance of immediately reporting health conditions and documenting medical treatment. The Inspector General found the same problem, with all LOD program managers interviewed identifying an overall lack of understanding about the LOD and MEDCON programs.

Courtesy

Arizona Air National Guard pilot Lt. Col. Christy Kjornes flew KC-135 tankers around the world for seven years before a medical condition left her grounded in 2020. It took another four years for the Air Force to recognize her injuries were incurred in the line of duty and properly compensate her for them.

Buckley tried to push through his shoulder issues, but within a year after the initial injury, he couldn't even finish a pull-up. A personnel specialist told Buckley to report the time of the initial injury in a statement, but with more than 180 days having elapsed since the initial injury occurred, it was deemed a non-reported injury, and therefore not in the line of duty.

Buckley later learned the specialist had been wrong; the injury had to be reported within 180 days of the end of the orders covering the period when the injury occurred. Buckley had consecutive orders between the initial injury and reporting it, so he was still within the time limit. He also learned that a re-injury of an old injury is a new injury. So when he jumped on the pull-up bar and realized something was wrong, that should have reset the clock.

The IG found such mistakes common across the service. Two complainants told the IG they were improperly required to provide statements regarding their injuries that were then used against them; four others said their wings initially refused to submit LODs, despite an obligation to do so under Air Force regulations.

None of the PMs interviewed by the Inspector General received official training or instructions for their position, and there is no comprehensive, mandatory training program.

"Many reported feeling uncomfortable managing the program for many months to years before they could confidently fulfill their responsibilities," the IG wrote. "LOD PMs report learning through on-the-job training, trial and error, and asking peers for advice."

There is so little training that one of the IG's recommendations was that ARC members "should be provided the rights advisement any time they are requested to provide a statement" about the origin or aggravation of their disease or injury. That is actually required under federal law, Gohr said.

"Why does it take an IG investigation to recommend 'please comply with the law?'" she asked.

WORKLOAD

The Air Reserve Component Line-of-Duty Board for the National Guard consists of six medical providers, four judge advocates, and three staff from the Guard Bureau's personnel directorate. Because of a backlog, the NGB recently added three additional lawyers to help. Reviewing LODs are just one of several primary duties for board members, NGB said.

On the Air Force Reserve side, the primary function of six medical providers is to provide medical case reviews as part of the LOD Board, with another three who can assist when needed. Up to five judge advocates provide legal reviews outside of their primary responsibilities, while two colonels from the personnel directorate review LOD cases as their primary duty.

Their workload is heavy: The Guard's Board reviewed 10 to 36 LOD cases a week from 2018 to 2023, according to the Guard Bureau; while the Air Force Reserve reviewed another 20 to 25 cases a week over the same period. Files can contain hundreds of pages of medical records.

The Guard's Board reviewed cases in 43 to 57 days between 2020 and 2023. For the Reserve's Board, the average time to complete a review was slower, but improved from 266 days in 2018 to 69 days in 2023.

Inconsistent language and interpretations are an ongoing problem. Often, the determining factor is whether an injury was aggravated by time in service, but interpretations vary, which has led to errors in LOD procedural accuracy, AFRC told Air & Space Forces Magazine.

"Efforts have been made to clarify medical evidentiary standards, so they are applied consistently, particularly regarding service aggravation," AFRC said. "Ultimately, human interpretation of complex legal and medical evidence is required to ensure LOD determinations comply with law and policy."

The IG report agreed. "Chronic conditions that first exhibit themselves when the members are on orders are especially difficult to assess," the IG said.

Specific medical expertise may be required, but that expertise cannot be guaranteed, as when an OB-GYN was assigned to review Kirlin's spine injury.

The IG recommended the Surgeon General designate medical specialists to sit on and advise the LOD boards and appellate authorities. Whether that will happen remains to be seen, but no such directive has been made.

AFRC said physicians trained in aerospace medicine use their clinical judgment to recommend when to contact a specialist, and it is up to the LOD Board to decide when specialist consults are necessary. Similarly, the Guard has no formal criteria for when specialists should be consulted.

NILOD determinations do not identify the name or contact information for specialists if they are consulted.

'A REALLY BROKEN PROCESS'

Appealing a NILOD determination is an uphill battle. Guardsmen must appeal through the commander of the Air National Guard Readiness Center and Reserve members must go through the deputy commander of the Air Force Reserve. But because the LOD Review Boards provide little in the way of evidence, appellants have little ground to work with in contesting the results.

"How do I combat the research you did if you don't tell me what you did?" asked one Airman in the IG report.

An LOD program manager agreed. "When I have a case that I believe … 'this is in the line of duty, you know, and we need to appeal this.' … I have to phone a friend in AFRC and say 'hey, can you read me the internal comments so I can see why they're feeling this way?'" the program manager said. "So that is, I think, a really broken process."

Most appeals are denied with a single sentence: "Your appeal is denied under DAFI 36-2910,'" with no further justification or explanation, Gohr said.

The Air Force Board for Correction of Military Records is the final appeal authority. AFBCMR considered 42 appeals from fiscal 2019 to fiscal 2024, and just 14 (33 percent) were successful.

Appealing is a glacial process. Kjornes, the KC-135 pilot, first reported her injury in November 2020 and started her appeals in June 2022. Not until August 2023 did the BCMR finally rule in her favor. It took until late 2024 for her records and pay to be corrected. According to The Veteran's Advocate, which represents RC members in these issues, a typical BCMR appeal takes 18 to 24 months to resolve.

Kirlin's case took even longer to resolve. After the initial denial, the F-15 pilot submitted a 14-page NILOD appeal in November 2023, receiving two months later a one-page reply that acknowledged the erroneous reference to a nonexistent MRI, but held to the original judgment. On Dec. 31, 2024—more than five years after Kirlin's injury—the director of the Air Force Review Boards Agency signed a decision to overturn the pilot's 2022 NILOD. Now Kirlin is going through the disability evaluation system, waiting for a determination on whether he is fit for duty and to what extent he will be compensated.

"That's only after five years, tens of thousands of dollars in legal expenses, inspector general complaints, and advocacy work," said Jeremy Sorenson, a retired Air National Guard fighter pilot and advocate for reforming the LOD process.

Even with an ILOD, staying on medical continuation orders is not a guarantee. Federal law requires that members hurt on Active duty be put on Active orders to receive medical care while they go through the disability evaluation system—unless the injury is the result of gross negligence or misconduct. But Air Force regulations empower the ARC Case Management Division Chief to terminate those medical continuation orders, or MEDCON, if the member's treatment plan requires less than two health appointments a week.

"Anything less than that … I begin to question really, why does that person need to be on MEDCON," the ARC CMD Division Chief told the IG.

But serious conditions can exist and not require frequent medical appointments. "If you have a broken leg, you're not going to go in to the doctor twice a week," one complainant said. "'How can ARC CMD expect you to have two appointments per week to stay on MEDCON orders?' This doesn't make sense."

An LOD program manager agreed: "We've had many cases cut off because of that two appointments," the PM said. "That's not always efficient or it's not good for the taxpayer. … If the member doesn't actually need that two appointments."

THE DEFINITION OF INSANITY

The IG report made 12 recommendations to improve the LOD process, such as requiring a “thorough and comprehensible explanation” of NILOD determinations; standardizing LOD program manager responsibilities and training; developing ARC-wide awareness training for troops and leadership; and conducting an independent review of the ARC LOD determination board process, to include the staffing and expertise of board members.

But Sorenson and Gohr say the problems are so deeply seated that only new leadership and more oversight can solve the matter.

“It’s great to say this should all be re-done, but without better direction or putting new people in charge of it. … The definition of insanity is doing the same thing and expecting a different outcome,” Gohr said.

The advocates know the 11 complainants who were interviewed for the IG report, each of whom had filed inspector general complaints of their own. Complainants said their health conditions were incorrectly determined to be NILOD and their LOD submissions had been processed incorrectly, but the vast majority of their complaints were unsubstantiated.

“You have a big report that says there are flaws in the system, and it’s not transparent, and the standards are not being applied appropriately, and there’s a large variation in what counts as clear and unmistakable evidence,” Gohr said. “If your overall review of the LOD process comes to conclusions like that, how then do you not have substantiated claims for those individual cases?

“There is a lot of fault within the system,” she added, “but nobody’s being held at fault.”

A BETTER WAY

Issues with the LOD process arose as the Reserve Component transformed from a strategic reserve to an operational force over the past few decades. The Active-duty force is not big enough to counter instability in the Middle East, deter Russia and China, and respond to natural disasters at home all at once, the RAND Corp. noted in a 2022 report. This creates an “inherent tension and contradiction” in having a part-time force held in reserve that is also ready for conflict at any time.

Gohr understands that contradiction every time she goes for a run to meet physical training requirements. “If I step off a curb and break my ankle, that’s not in the line of duty, even though the only reason I am running is because I have to maintain physical fitness standards all year long, even when I’m not in [active] status,” she said.

Some advocate that the same no-cost, full-time Tricare coverage Active-duty troops get should be extended to Reservists and Guardsmen. That was a priority for Army Gen. Daniel R. Hokanson during his tenure as NGB chief from 2020 to 2024. Guardsmen and Reservists deemed nonmedically ready were more likely to be uninsured, according to a 2021 report by the Institute for Defense Analysis.

Roughly 60,000 Guardsmen do not have health insurance, according to 2023 data from the National Guard Bureau, and the nonprofit National Guard Association of the United States reported as many as 130,000 Reserve Component personnel have no “consistent” health insurance. There are about 760,000 RC members in total, so about one in five lack consistent medical care.

The IDA report estimated it would cost $2.5 billion to extend premium-free Tricare Reserve Select to all Reserve Component troops and dependents.

Hokanson told Air & Space Forces Magazine shortly before retiring in August 2024 that free health care for RC troops could benefit retention and make them more attractive to employers, who wouldn’t have to pay for their insurance. He said business leaders had told him “that is probably one of the best things that we could do to encourage businesses to hire Guardsmen.”

Bipartisan bills supporting zero-cost Tricare coverage for Guardsmen and Reservists have been introduced in recent years, but thus far have not passed.

Sorenson said health insurance would help, but won’t solve the problem. If an RC member is hurt, they might not be able to work their civilian or military job, leaving them without income. And before the member receives any compensation, the disability evaluation system must wait for an ILOD determination.

After five years, Kirlin finally won his case, but two out of three appellants weren't so lucky. It takes time, money, and determination for members to get what they deserve, advocates say. For those lacking in any one of the three, they are left with injuries and thanks for their service—but not a penny more.

Steps to Better Support Airmen

Jeremy Sorenson, a retired Air National Guard fighter pilot who has worked with dozens of service members affected by these issues, recommends 12 steps to improve the Reserve Component medical compensation process.

1. Comply with Title 10 USC and properly apply the legal presumption that injuries, illnesses and diseases are incurred and/or aggravated in the line of duty (ILOD) for members on military orders over 30 days.

2. Apply the proper, legal T10 USC evidentiary standards for all LODs.

3. Strict compliance with DODI 1241.01, 1332.18, and DAFI 36-2910 for all ARC members when they report injuries/illnesses/diseases.

4. Align DAFI 36-2910 and 36-3212 with DODI 1241.01 and 1332.18, and ensure strict compliance.

5. Provide MEDCON orders immediately upon report of injury/illness/disease as is required by regulation and law and remove ARC CMD's arbitrary termination criteria.

6. Delegate final LOD determination to wing commanders, because they know the service member’s situation better than higher-level ARC LOD boards.

7. Remove the ARC LOD review boards’ authority to overturn wing commanders' determinations.

8. Delegate appeal authority to an appropriate level, independent of the ARC LOD Boards.

9. Remove contractors from LOD processing, because contractors cannot be held accountable to the UCMJ and contracts create conflicts of interest.

10. Abolish the “review in lieu of/initial review in lieu of” process, a pre-disability evaluation system screening for which there is no ability to appeal.

11. Objectively investigate outside of DAF/NGB of all ARC NILODs and return without action “RWOA” LODs for the previous 5 years.

12. Instate a SAF-level Review Board to provide recourse for unlawful denial of LODs/MEDCON/IDES processing, comprised of independent, knowledgeable personnel.

OUTSTANDING AIRMEN OF THE YEAR

The Outstanding Airman Program annually recognizes 12 enlisted members for superior leadership, job performance, community involvement, and personal achievements.

The Air Force Association drove the creation of the Outstanding Airmen of the Year program, which debuted at AFA's 10th annual convention in 1956. Airmen selected receive the Outstanding Airman of the Year ribbon with bronze service star device; they also wear the Outstanding Airman badge for a full year. This year's honorees were chosen by a selection board from among nominees advanced by commands in the Air Force and Space Force.

MSgt. Ryan B. Girard

Duty Title: Professional Military Education Instructor
Organization: Mathies NCO Academy, Keesler AFB, Miss.
Home of Record: Woonsocket, R.I.

Master Sergeant Girard demonstrated exceptional leadership while serving as an E-8 deputy commandant. He led development of three Primary Military Education curriculum tiers and certified 26 development advisors across five MAJCOMs, enhancing support for 400,000 Total Force Airmen. Girard led a SECAF International Affairs team to the Middle East, delivering a mission command symposium to 32 allied nations and advancing 27 security cooperation agreements. He also taught the United Arab Emirates' first-ever female-integrated PME course, enhancing joint service relations. As interim Senior Enlisted Leader, he helped shape a $52 million cyber range upgrade impacting 27,000 students. Finally, recognizing a medical crisis at the Defense Health Agency, he launched Keesler's first blood donor site, rallying 72 volunteers, and expediting lifesaving blood to 21 partner nations.

USAF

MSgt. Jurgen H. Kuse

Duty Title: Direct Accessions Manager
Organization: Air Reserve Personnel Center, Buckley Space Force Base, Colo.
Home of Record: Orlando, Fla.

In 2024, Master Sergeant Kuse's leadership and expertise significantly bolstered Reserve officer accessions and retention, boosting Air Force resiliency and readiness across the service. He overhauled training protocols, cutting on-the-job training by 83 percent, enabling the commissioning of 1,700 officers. Kuse trained 134 recruiters and leaders, leading to 223 accessions and helping AFRC reach 101 percent end-strength for the first time in two years. Supporting Chief of Staff of the Air Force Gen. David Allvin's "Generate Readiness" initiative, he helped reduce pay delays for 1,400 Reserve Muster attendees by 90 percent. And as ARPC Top III Vice President, he revitalized the Star Performer Award program and launched professional writing courses to enhance enlisted development.

USAF

MSgt. Aimee F. Pascas

Duty Title: Chief of Information Protection
Organization: 110th Wing Information Protection Office, Battle Creek ANG Base, Mich.
Home of Record: Brooklyn, Mich.

Master Sergeant Pascas demonstrated her expertise and innovative spirit throughout 2024. She led a revolutionary child care beta test and hosted the CMSAF, resulting in a scalable ANG-wide program. Pascas overhauled her wing's security policies and built an information protection program, contributing to an "Effective" Unit Inspection rating. Selected by DAF leadership, she served as the CMSAF's Special Projects Officer, managing a $10,000 budget and leading 46 volunteers to ensure a seamless transition between the 19th and 20th CMSAFs. Finally, as Anti-Terrorism Program Manager, she chaired a threat working group in response to local risks, safeguarding 950 wing members and mission continuity. Handpicked for the First Sergeant 2.0 Course, she authored 36 blocks of instruction, standardizing training for 863 first sergeants and reshaping enlisted development across the Air Force.

USAF

MSgt. James B. Vetter Jr.

Duty Title: Action Officer
Organization: Hq. Air Mobility Command, Scott Air Force Base, Ill.
Home of Record: Aurora, Colo.

Master Sergeant Vetter proved invaluable to Hq. AMC in 2024. He actualized the command's counter-drone initiative, fielding 24 systems to protect $300 billion in assets and 1 million people across nine combatant commands. He led 386 Airmen through more than 13,000 security hours across 5,000 sorties and built critical staging points supporting crisis response for the Israel-Hamas conflict, U.S. withdrawal from Niger, and Haiti unrest. His efforts enabled movement of 15.4 million pounds of cargo, 1,700 personnel, and $60 million in relief, plus an evacuation plan for 180,000 Americans. Vetter pioneered AMC's first organic cargo aircraft counter-drone capability, securing $332,000 in funding. He also served as an inspiration to others, leading volunteer events that raised more than $50,000 for outreach programs and earning his master's in leadership. His efforts inspired his team to collectively complete a grand total of 228 credits and six degrees.

USAF

TSgt. Jamie A. Gardner

Duty Title: Retention Office Manager
Organization: 190th Force Support Squadron, Forbes Field ANG Base, Kan.
Home of Record: Lawrence, Kan.

Technical Sergeant Gardner demonstrated innovation and leadership throughout 2024. As the new Resource Manager, she resolved a nine-month financial backlog, recovering more than $600,000 in payments. Her logistical skill enabled the flawless deployment of 95 joint personnel and 24.4 tons of cargo across five AORs, earning her a Meritorious Service Medal and recognition as the 2025 Kansas ANG Outstanding NCO of the Year. Gardner developed a new Ready Airman Training Rodeo curriculum, leading 410 members through 25 tasks with a 95 percent completion rate and securing $160,000 in resources. As a Rising Six leader, she organized 82 events supporting Airman fitness, directly benefiting 75 members. Finally, her community impact included raising $1,500 for Mothers Against Drunk Driving and establishing a statewide awareness day on the dangers of impaired driving.

USAF

TSgt. Selina Ortega

Duty Title: Master Military Training Instructor
Organization: 433rd Training Squadron, Joint Base San Antonio-Lackland, Texas
Home of Record: JBSA-Lackland, Texas

Technical Sergeant Ortega exemplified professionalism and excellence throughout 2024. She educated 280 civic leaders on the 37th TRW mission, showcasing Basic Military Training innovation and AETC's role in developing the future force for the Air and Space forces. As the BMT Curriculum Review Chair, she optimized trainee allocations, increasing participation by 12 percent without added infrastructure. Ortega launched the "Ask an MTI" program, aligning 64 instructors for 672 recruits, leading to a 23 percent reduction in trainee attrition. Filling a critical executive assistant role, she forecast manpower needs, stabilizing workloads for over 600 instructors. She also implemented a peer-to-peer survey to refine the Master MTI certification process, increasing certifications by 4 percent. Finally, Ortega created the "Warhawk Podcast," which reached 1,200 Airmen and has improved morale and mental health across BMT.

USAF

TSgt. Brandon L. Vazquez

Duty Title: Fuels Quality Compliance Section Chief
Organization: 325th Logistics Readiness Squadron, Tyndall Air Force Base, Fla.
Home of Record: St. Cloud, Fla.

Technical Sergeant Vazquez demonstrated exceptional leadership, innovation, and ingenuity in 2024. Named the 325th's Lance P. Sijan Jr. Enlisted Member of the Year, he led 45 Airmen across five sections in five joint exercises, delivering over 8 million pounds of fuel and generating 1,700 sorties across 14 units. Vazquez leveraged his Green Belt certification to revamp 11 fuel programs, boosting fleet readiness from 32 to 86 percent in just one week. He overhauled Lackland's MTI eval program, closing SME (subject-matter expert) gaps and producing 25 "Blue Ropes." Partnering with the 95th Fighter Squadron, he pioneered hot-refuel ops, certifying 15 Airmen and cutting jet regeneration time by 75 percent. As the first Airman to complete the Navy's "Chief Season," he earned Honorary Navy Chief honors. He capped off 2024 by leading the wing's Airpower Leadership Academy, shaping future leaders.

USAF

SSgt. Matthew C. Sanders

Duty Title: Explosive Ordnance Disposal Equipment NCOIC
Organization: 19th Civil Engineer Squadron, Little Rock Air Force Base, Ark.
Home of Record: Ridgecrest, Calif.

Staff Sergeant Sanders excelled in 2024 by managing seven-unit type codes and three munitions accounts worth $15.2 million. His leadership enabled 57 off-base responses, earning his team multiple wing awards. During a 205-day deployment, he led four joint exercises with Naval Special Warfare units, training 34 members. Then, following a deadly drone strike, his post-blast analysis led to POTUS-directed strikes on 86 high-value targets, earning him a Joint Service Commendation Medal. He eliminated a 174-case backlog at the Army forensics lab, processing over 2,500 Iranian weapons, and updated terrorist exploitation tactics and procedures for 6,500 EOD technicians DOD-wide. Off-duty, he volunteered with his church to build a child care center and facilitated peer counseling, boosting morale across his joint service team.

USAF

USAF

SSgt. Lucas K. Shappell

Duty Title: Explosive Ordnance Disposal Journeyman
Organization: 934th Civil Engineering Squadron, Minneapolis-St. Paul Air Reserve Station, Minn.
Home of Record: Minneapolis

Staff Sergeant Shappell distinguished himself through unwavering mission focus and excellence in service. Drawing on Naval Warfare experience, he led advanced small squad training in close-quarters battle, equipping 11 personnel with critical urban combat tactics. During a response to an unexploded ordinance, he advised Kosovo Security Forces, applying U.S. tactics and procedures—enhancing service interoperability and helping bolster regional security. Shappell also developed threat ID training for federal agents and qualified 120 allied members during a humanitarian mine action mission. As an explosive SME (subject-matter expert), he corrected 15 flaws for the U.S. Forest Service, avoiding major R&D costs. He also volunteered with the sheriff's department, aiding in recovery of a submerged vehicle tied to criminal activity.

SrA. Roman Bereguta

Duty Title: Financial Accounting Technician
Organization: 21st Comptroller Squadron, Peterson Space Force Base, Colo.
Home of Record: Green Cove Springs, Fla.

Senior Airman Bereguta distinguished himself in 2024 by performing duties well above his grade. He filled an E-6-level role, leading a team that validated a $4.8 billion budget, supporting 23 bases. His outstanding performance earned him Senior Airman Below-the-Zone selection. During a 189-day deployment, he served as a trilingual interpreter for senior leaders, enabling the transfer of $10 billion in U.S. weapons to Ukraine—helping protect 43 million lives and safeguard $8 billion in assets. As NATO SOF's sole linguist on their first deployment to Ukraine, he translated 60 pages of top-secret transmissions. In 2024, he also completed his Community College of the Air Force degree and several PME courses. Finally, his leadership helped raise over $2,000 in support of refugee aid efforts.

BEREGUTA
RAPTORS
ALPHA SQUADRON
BEREGUTA
U.S. AIR F

USAF

SrA. Amal Djezzar

Duty Title: Contract Specialist
Organization: 99th Contracting Squadron, Nellis Air Force Base, Nev.
Home of Record: Las Vegas

Senior Airman Djezzar demonstrated exceptional leadership and expertise beyond her rank, which led to her promotion below the zone. Amid 50 percent manning, she excelled in a SNCO role, executing 48 critical actions worth $6 million. While deployed for Operation Spartan Shield, she revamped Saudi customs forms, boosting bomber task force mission efficiency by 90 percent across 75 targets. She also played a key role in transitioning ACC's largest medical contract to the Defense Health Agency, impacting 12,000 personnel and 330,000 beneficiaries—earning praise from the AFCENT Commander. Leveraging her MBA and multilingual skills, she partnered with Royal Saudi Air Force's Chief Master Sergeant to lead an all-female workforce initiative and launched Prince Sultan Air Base University's first Arabic course—saving the Department of the Air Force $150,000 in tuition costs.

USAF

SrA. Eleanor R. Warren

Duty Title: Geospatial Intelligence Analyst
Organization: 192nd Intelligence Squadron, Joint Base Langley-Eustis, Va.
Home of Record: Mechanicsville, Va.

Senior Airman Warren was the epitome of the Air Force core values in 2024. She deployed to Japan, supporting 94 missions, producing 302 imagery reports, and 87 analytical products for the U.S.-Australia-Japan intelligence cell. She pioneered a cross-classification solution, enabling first-ever tracking of vessels violating U.N. sanctions on North Korea. Warren translated Japanese recognition guides, enhancing partner interoperability and enabled approval of 13 taskings and fragmentation orders supporting sensitive operations in contested environments. Warren supported four State Department engagements with Sudanese and Libyan leaders, advancing diplomatic security, airspace access, and counterterrorism goals. Outside her primary responsibilities, she organized a 120-member multinational lacrosse team and founded the base's first youth lacrosse team, mentoring young athletes.

USAF

AFA IN ACTION

By Susan Mallett

AFA Announces Ashlie Smith as 2025 Teacher of the Year

The Air & Space Forces Association, in partnership with Rolls-Royce, announces the 2025 national winners of the Thompson-Mallett National Teacher of the Year award, recognizing three extraordinary educators for their innovative work in aerospace-focused STEM education.

Courtesy

Ashlie Smith, the 2025 winner of AFA's National Teacher of the Year award.

FIRST PLACE: ASHLIE SMITH

Taking top honors is Ashlie Smith, an 8th-grade physical science teacher at Cranbrook Kingswood Middle School for Girls in Bloomfield Hills, Mich. With a 24-year career steeped in creativity and dedication, Smith is a leader in aerospace education, empowering young women through hands-on scientific exploration and global collaboration.

Smith's pioneering work includes leading student participation in the "Cubes in Space" and "Space for Teachers" programs, with over 40 student-designed experiments launched on sounding rockets and high-altitude balloons. Her students have even designed and flown propellant management devices and microgravity experiments aboard Zero-G flights.

In 2024, Smith co-led a STEM teacher workshop in Lagos, Nigeria, sparking a transcontinental classroom collaboration that connected students across cultures through shared science projects. Her leadership helped fly Nigerian student-designed toys in microgravity alongside American student experiments, showcasing the unifying power of STEM education.

"Aerospace isn't just a content area; it's a launchpad," Smith said. "When every student sees their value in the mission, they don't just learn science—they live it."

Smith receives a $3,000 award and the prestigious diamond AFA National Teacher of the Year pin during the AFA's National Convention and the Air, Space & Cyber Conference in National Harbor, Md., this September.

SECOND PLACE: KALA GRICE-DOBBINS

Courtesy

Kala Grice-Dobbins

Securing second place is Kala Grice-Dobbins, a high school cybersecurity teacher at Madison County Career Tech Center in Huntsville, Ala. With nearly two decades of experience, Grice-Dobbins is a trailblazer in preparing students for the evolving demands of cybersecurity and technology careers, especially in underserved and rural communities.

She has secured over $100,000 in grants, enabling the purchase of cutting-edge equipment—from digital forensics kits to 3D printers—giving students direct access to real-world tools. Grice-Dobbins also developed a full-year cybersecurity curriculum based on AFA's CyberPatriot program, with her student teams consistently reaching national semifinals and dominating state-level competitions.

THIRD PLACE: LUKE BECKER

Courtesy

Luke Becker

Luke Becker, an Agricultural and Technology Education teacher and CTE Coordinator at Armstrong High School in Plymouth, Minn., receives third place honors for his visionary integration of aerospace engineering and STEM into student-centered innovation.

Becker leads one of the nation's premier NASA HUNCH (High School Students United with NASA to Create Hardware) programs. Under his guidance, students have developed hardware currently under NASA review, including a microgravity IV administration system and a lunar worktable. His school was recently named a NASA HUNCH Center of Excellence—one of only four in the U.S.

AFA's Doolittle Leadership Center Launches New Podcast: 'Building Better Leaders'

ARLINGTON, VA.

The Air & Space Forces Association's Doolittle Leadership Center (DLC) has announced the launch of "Building Better Leaders," a podcast featuring candid conversations with leaders from diverse industries, professions, and backgrounds.

The podcast is designed for anyone interested in strengthening their leadership skills—students, professionals, executives, community influencers, service members, or even parents. Each episode explores real-world lessons and practical strategies for leading effectively, whether on the battlefield, in the boardroom, or within local communities.

DLC Director Patrick Donley talks leadership with Gen. Anthony Cotton, Commander of U.S. Strategic Command, on the first episode of "Building Better Leaders."

Master Sgt. Taylor Drzazgowski

"Our mission at the Doolittle Leadership Center has always been to build better leaders," said DLC Director Patrick Donley. "This podcast extends that mission by making leadership lessons accessible to everyone. Great leadership isn't just for those with a title—it's for anyone who wants to make an impact."

Early episodes of "Building Better Leaders" feature Air Force and Space Force leaders discussing topics such as building resilient teams, leading through uncertainty, and balancing accountability with empathy. Guests include Gen. Anthony J. Cotton, Commander of U.S. Strategic Command, who offers lessons from leading 41,000 personnel in global operations, and Lt. Gen. Doug Schiess, Commander of U.S. Space Forces–Space, who draws on 33 years of service to discuss balancing mentorship, authority, duty, and family.

The podcast supports Doolittle Leadership Center's ongoing commitment to equip leaders with the resources to grow and succeed throughout their careers.

New episodes will be released regularly on Spotify, Apple Podcasts, YouTube, and other major platforms.

ABOUT THE DOOLITTLE LEADERSHIP CENTER

AFA's Doolittle Leadership Center's mission is "Building Better Leaders." In the spirit of AFA's founding President, Gen. Jimmy Doolittle, the DLC delivers leadership-training courses, workshops, and resources to Air Force, Space Force, industry and community leaders around the world.

When GPS Isn't Available, AQNav Delivers Assured Navigation.

Resilient navigation built for contested, spoofed, and GPS-denied environments.

GPS FAIL

GPS is contested. Assured Navigation is essential. AQNav holds position in GPS-denied environments by leveraging the Earth's crustal magnetic field with proprietary algorithms.

- Unspoofable. Unjammable.
- All-weather. Terrain-agnostic.
- Passive. Sensor-fusion enabled.

Engineered for rapid integration and intuitive operation across transport and tanker platforms.

45×
improvement in accuracy over standard INS-only systems in simulated military transport GPS-denied mission over Ukraine (~0.1 km vs ~5 km error)

70%
of pilots identify GPS spoofing as a "very high" operational risk

One of the greatest unsolved aviation risks of the 2020s

Available now for deployment, testing, and simulation.
aqnav@sandboxaq.com | sandboxaq.com/aqnav

SANDBOXAQ

HEROES AND LEADERS

By Col. Phillip S. Meilinger, USAF (Ret.)

William H. Tunner

"Willie the Whip" revolutionized airlift transport.

Bill Tunner was an airlift genius who was formative in shaping America's worldwide power projection capability. Airlift may not always be glamorous, but it is usually essential in achieving the nation's political objectives.

Tunner graduated from West Point in 1928 and joined the Air Corps. Initially, he flew bombers, but an early incident changed his career trajectory. He was directed to fly some Soldiers to Sacramento, Calif. He had never been there. Arriving at the flight line he saw he would be flying a Fokker Trimotor; he had never flown one of those. There was no flight manual. There were no pilots around with experience in the plane to give him instructions—an enlisted mechanic explained some of the instruments and switches. There were no aeronautical charts handy. There was no weather report. Tunner made the flight safely but decided that when he was the boss such haphazard and dangerous practices would change.

When the U.S. entered World War II he found himself in Ferry Command—air transport—and he would never really leave. Tunner was known as a brilliant administrator and organizer who had a clever and innovative mind. He suggested to Gen. Henry H. "Hap" Arnold, for example, that women be used to ferry aircraft around the U.S.—they were excellent pilots, and it would free up the men for combat. His idea was accepted.

An airlift was needed to move supplies from Burma over the Himalayan mountains into China, but initial operations were of limited use. In 1944 Tunner arrived. The route over the Hump was extremely hazardous, but his incessant demands for organization, standardization, and safety quickly paid dividends. Chiang Kai-Shek wanted 5,000 tons of supplies per month to sustain his armies. By the end of the war, Tunner was moving over 71,000 tons per month: the operation cost over 1,300 crewmen with another 345 missing, so the price was steep.

China and Burma were considered backwaters, so the magnitude of the Hump operation was not appreciated by many. That would soon change. In 1948 the Soviets cut off land access to West Berlin, thinking the Americans, British and French would then leave, but President Harry Truman reacted instead by ordering an airlift to sustain the city.

Tunner took over. He was impressed by the spirit of the Operation Vittles aircrews—as the operation had been dubbed—but it was inefficient and dangerous. He introduced procedures that had proved successful on the Hump, would soon become standard in all airlift operations, and were already employed by airlines. Flight plans, weather briefings, aircraft servicing, and unloading were all prepared in advance by ground crews. More radio marker beacons were installed to help pilots keep track of their exact position, approach radars and airfield lighting were upgraded, radio transmissions were simplified, and air traffic control was systematized with aircraft landing around the clock at three-minute intervals. Eventually, it took a mere 10 minutes for German workers to unload an aircraft.

Under Tunner's guidance, the airlift became a marvel of efficiency and reliability as tonnage and sortie rates soared. Soon, a fleet of 300 American and British aircraft were delivering 9,000 tons of food and coal daily. On April 15, 1949, the airlift set a one-day record by moving an incredible 12,941 tons in 1,383 flights.

USAF

Lt. Gen. William Tunner was known for his superb organizational skill, drive, and attention to logistics and safety during airlift operations.

Vittles was employing most of the USAF's inventory of cargo planes, plus aircraft from the Navy, Britain and France, but then the Soviets blinked. Their worst fears were being realized as the Western nations and Germany banded more closely together, so on May 12, 1949, the Soviets reopened the landlines to Berlin. The blockade had been a public relations disaster for Soviet dictator Joseph Stalin.

Overall, the airlift moved 2.3 million tons of cargo (mostly coal) in over 275,000 flights. There were 70 major accidents and 83 military and civilian personnel died during Vittles, but the airlift had saved Berlin: It was the West's greatest victory of the Cold War, achieved by airpower without firing a shot.

The following year the Korean War erupted and Tunner was tasked to run a massive airlift of men and supplies to Asia. Again, it was successfully accomplished. As one observer noted, "Before Korea, air transport had never been considered a key part of a theater combat plan. Tunner and the airlifters' performance in Korea changed that thinking."

Tunner had a difficult personality, often described as moody, mercurial and contrary, but no one questioned his initiative, drive, and organizational or administrative acumen. He eventually took over the Military Air Transport Service—forerunner of Air Mobility Command—and made airlift a vital and recognized part of America's power projection force. There he pushed for jet airlifters like the C-141 and C-5, which soon entered the inventory.

*Lt. Gen. William H. Tunner retired in 1960 and died in 1983. His memoirs, "**Over the Hump**," are excellent, and for a biography, see the outstanding "**Master of the Air**" by Robert A. Slayton.*

Ready today.
Prepared for tomorrow.

Visit CAE booth **#1923** at the
AFA Air, Space & Cyber Conference

CAE

cae.com/airforce

TIME TO
GET REAL

Real threats call for real capability — the kind that only the YFQ-42A Collaborative Combat Aircraft (CCA) provides. Like the growing fleet of unmanned combat jets it's part of, YFQ-42A is designed to deliver real performance for an unprecedented advantage in military aviation.

The future of airpower. Ready today.

GENERAL ATOMICS
AERONAUTICAL

©2025 GENERAL ATOMICS AERONAUTICAL SYSTEMS, INC.

Avenger®, EagleEye®, Gray Eagle®, Lynx®, Predator®, Reaper®, SeaGuardian®, and SkyGuardian® are trademarks of General Atomics Aeronautical Systems, Inc., registered in the United States and/or other countries.